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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Views on the New Price Factor

THE opinions published this week in our Dyestuffs Monthly Supplement on the effects of the new price factor which the Licensing Committee has decided to introduce in September reveal considerable and quite natural differences of opinion, according to the angle from which the matter is viewed. Putting the more temporary and casual aspects of the change aside for the moment, the opinion that calls for the most serious attention is that of a high authority on dyestuffs research and production, whose name is not disclosed and whose views may therefore be considered quite impersonally. The point he makes is that the Dyestuffs Act guaranteed ten years of protection in order to enable a national dyestuffs industry to be built up. It is not a long period when one considers the heavy handicap under which the industry started, and the enormous scientific, technological, and commercial organisation to be established. If, by the year 1931, it can be said that the British dyestuffs industry is strong enough to stand on its merits against the open competition of the world, it will be one of the greatest achievements to the credit of British chemistry. But the ten years are not yet up, and the point our correspondent makes is that it is unfair to the dyestuff makers to expect at the end of seven years what they were given ten years to achieve In other words, to expect at this stage price equality with foreign competitors is premature. Every one in the industry knows what the production of even one new colour may involve—the costly research work, the conversion of laboratory successes into successful works operation, and so on. There is, therefore, substance in the point that the maker should have a reasonable time limit in which to repay himself for the initial outlay. It is estimated that the reduction of the price factor from $2\frac{1}{2}$ times pre-war price to 2 is equivalent to a 20 per cent. reduction on gross revenue, and that a considerable increase in the weight of products sold will be required to make up the difference. It would have been fairer and also better policy, our correspondent thinks, to make a 10 per cent. reduction now, and another reduction twelve months hence.

From the point of view of the dyestuff users, two notable contributions are made. That of the British Cotton and Wool Dyers' Association is significant. Mr. Hoegger states that, while any reduction is welcome, the present reduction, per lb. of material dyed, will be so slight that the consumers will be practically unable to make any concession in their process charges to their customers. This seems to bear out the contention that the cost of the dyes used bears a very small proportion to the cost of the finished article, and that the price competition must be very fine indeed before the cost of the dye becomes the decisive factor. Mr. Sutcliffe Smith's view—and he has kept a very fair and level attitude as between a natural desire for cheap dyes and loyal support to the establishment of a home industry—is that the reduction will not only be helpful to the colour consuming industries, but will even react in favour of the dyestuff makers.

Yet another interesting point, which we have not seen noticed before, is made by an important firm of makers. They point out that, in comparing German and British prices in order to determine whether an import licence should be granted, the differences in strength may be overlooked. German standards, it is suggested, are considerably higher in strength and tinctorial value now as compared with pre-war standards, without any alteration in actual brand marks, and where this fact is not taken duly into account the protection of a price factor may in practice become less effective than it is meant to be. We do not know how far the suggested practice is in operation, but the point is worth drawing attention to.

As to the other replies, they bear out several of the things we ventured to say last week. L. B. Holliday and Co. state that the average sale price is already nearer to a factor of 2 than to a factor of $2\frac{1}{2}$, and that this is the case in spite of the high cost of primary intermediates and raw materials. They justifiably

point to their own large export trade as evidence that dyestuffs are already being produced here and sold in competition with world prices. The prices of raw materials, they contend, can and should be lowered, and if this is done by September, colour makers should be able to work to the new price factor. Brotherton and Co. also complain of the cost of intermediates, hold that the new factor will retard the development of the industry, and claim that, in view of the cost of producing a new dyestuff, a reasonable time to recoup losses should be allowed. J. C. Bottomley and Emerson state that many of the basic raw materials are no cheaper now than a year ago, and fear that in certain cases it will be economically impossible to produce dyestuffs without loss. On the other hand, the Yorkshire Dyeware and Chemical Co. say that the change will not affect them, as many of their colours are already being produced below fixed limit and nearer to pre-war prices.

These opinions, of course, are not comprehensive, though representative, but they are distinctly interesting as showing the different senses in which the new price factor is regarded.

The Edinburgh Meeting

THE annual meeting of the Society of Chemical Industry, which is fixed for Edinburgh during the week July 4 to 9, will be the 46th of the series, and there is every prospect of the high level of recent years being maintained. The president, Mr. F. H. Carr, has chosen as the subject of his address on Tuesday morning "Industrial chemistry and progress in medicine," while the Society's medallist, Lieut.-Colonel G. P. Pollitt, will deliver the Messel Lecture on Thursday morning on "The development of the synthetic nitrogen industry in Great Britain." "The physiological and industrial aspects of the chemistry of carbohydrates" will be discussed at a joint meeting with the Chemical Society, with Professor Barger in the chair, on Wednesday morning, and simultaneously the Chemical Engineering Group will meet to discuss "Some aspects of the manufacture of fibrous cellulose." There will be a conference on "Coal cleaning" on Thursday with Dr. Lander in the chair, at which the views of several experts will be presented.

The visits to works is always an important feature of these meetings, and there will be a good choice. The works to be inspected include the Edinburgh Corporation gasworks, the paper mills of James Brown and Co., the North British rubber factories, and the refineries at Grangemouth of Scottish oils, while excursions are being organised to Melrose, Abbotsford, and Peebles, to Forth Bridge and Inchcolm, to Gleneagles and St. Andrews, and to places of interest in old Edinburgh. The social side will be represented by receptions by the Edinburgh magistrates and council, the University Court, the East of Scotland Section and the President; a luncheon by the East of Scotland Section, a garden party at the Zoological Gardens, and the annual dinner on Wednesday evening. At the annual meeting of the Society proper the guests will be welcomed by Lord Provost Stevenson and Principal Sir Alfred Ewing, the Vice-Chancellor of the University.

Chemical Problems of the Future

FASCINATING as are the results of the investigations of modern physicists into the structure of the atom, there are few of us with a sufficiently wide outlook to conceive of their more or less immediate application to problems of life and industry. Yet Dr. Carl Bosch, of the I.-G., writing in the chemical supplement of the *Frankfurter Zeitung*, regards this as a matter requiring attention. Dealing with the chemist of the future, he stresses the need for a knowledge not only of isolated facts, but also of the general laws of physics and chemistry, in order that a deeper knowledge of chemical processes may be obtained. In the case of leading researchers, he is of opinion that, further, a knowledge of the recent developments of atomic chemistry and physics will be necessary, especially in their relation to structural chemistry, biochemistry, photochemistry, colloid chemistry, catalysis, etc., which will bring to solution problems which were inaccessible to the chemist of twenty years ago. In the main, however, the interest of Dr. Bosch's article lies in the problems which he regards as requiring investigation, for the chemical world at large is bound to pay attention to the views of one of the leading lights of the I.-G. As regards inorganic chemistry, even the well-known electrolytic production of caustic soda from salt is faced with the difficulty of the disposal of the chlorine, new fields of application for which will have to be sought. Much remains to be done in the extraction of metals and their salts from ores and minerals, to which the methods and results of physical chemistry must be applied: in this connection, special attention must be paid to the working-up of poor ores, and of ores containing a multiplicity of metals. In the domain of light alloys, the question of the extraction of alumina and aluminium from clays is of great importance. Among other aspects of metallurgy with which Dr. Bosch deals are the prevention of corrosion, and the application of oxygen in place of air in metallurgical operations. A cheap substitute for mica is urgently needed in the electrotechnical industries; while an unsplinterable glass for windscreens, etc., is within the realm of possibility.

As regards the question of artificial fertilisers, the liquefaction of coal and its economic utilisation, the production of cellulose from wood, and dyestuff chemistry, which subjects have all been very thoroughly aired in the last few years, Dr. Bosch's views need no comment; though here he remarks that more must be known of the application and action of the simple and compound fertilisers, and that special attention is being paid to the question of "ballast-free" soluble fertilisers. The therapeutical branch of chemistry clearly has very great possibilities. Advances are required in the scientific study of the action of drugs; and in especial attention is drawn to the glandular secretions. The problems of tuberculosis and cancer; of influenza (for which no specific drug is yet known); of foot-and-mouth disease; and of diseases of metabolism, such as diabetes, are all cited as examples of outstanding difficulties. For the narcotics morphine and cocaine, substitutes are needed, which will lack the harmful action of these on the nervous system. As regards the application of synthe-

tic drugs in tropical medicine, much work remains to be done, though it is encouraging to note that in this very branch the organic chemist has achieved some of his most notable victories. In a somewhat related field, the chemist must give serious attention to combating plant pests and plant diseases.

This necessarily hurried review gives some idea of Dr. Bosch's conception of the task confronting chemists and chemical industry, and of the enormous breadth of vision which is required of the technical directors of large-scale modern chemical undertakings. Incidentally, it is clear that even in Germany the public in some respects needs education: "It is far too little known and hardly understood, what extraordinary detailed work, and how much patience and time, are required to master profitably even a single one of the numerous problems. To be sure, it is easier to come forward with immediate results than to follow a high aim with tenacious work and without regard to the good opinion of the public . . . . A great chemical undertaking must not be the playground of egoistical tendencies. . . . Work must be done primarily not so much for the present as for the future."

The Trent Process

FROM accounts that have reached us from the United States, it appears that what is known as the Trent process is being developed with success in the production of "synthetic anthracite" made from various kinds of New England coal. These coals are high in ash content but low in volatile matter, and the purpose is to remedy both these defects. In the Trent process, high-ash coal is subjected to wet grinding, and thereafter agitated in a large volume of water to which a moderate proportion of fuel oil has been added. The oil selectively wets the coal and gathers its particles into little balls. The ash, for the most part, remains with the water and is washed away. The product of the de-ashing process is a putty-like amalgam containing about 10 per cent. water, 10 per cent. oil, and the balance as low-ash coal. For various reasons this amalgam has failed to find general acceptance as fuel for either domestic or power purposes. Quite recently, however, the process has been further extended, and the results obtained are of considerable interest. In the process, as now applied, the amalgam is extruded and cut to briquette size. The briquettes are baked under regulated temperature conditions, which permit the recovery of the major portion of the oil. The finished briquettes are said to be equal, if not superior, to anthracite as a domestic fuel. They are described as "uniform in size, dense, very hard, low in ash, with about 8 per cent. of volatile matter." They "ignite readily, burn freely without smoke, and maintain their shape for a long period."

Although as recently as last November, at the Pittsburgh international conference on bituminous coals, it was confidently stated that these high-ash coals could never be utilised effectively as fuels, the prediction appears to have been already reversed by recent experiments with the Trent process. As the result probably of British reports at the conference referred to on the low temperature carbonisation processes in this country, increasing attention is also being given in the United States to the low temperature problem, and the gas concerns are particularly interested. The idea, however, is much newer in the States than here. Although experiments are being developed, it is doubtful if there is yet in America any process that can be said to have established definitely a successful commercial status. It seems, nevertheless, probable that within a comparatively short time certain of the processes now in the development stage will take an assured and important place in fuel technology.

Oils, Chemicals and Colours

IT will be seen from our preliminary notes on the exhibits that the International Oil, Chemical and Colour Trades Exhibition, which opens to-day (Saturday) in London, and continues open for a week, covers a fairly wide field. It is being organised by International Trade Exhibitions, Ltd., and the promoters may be congratulated on the support they have received. That private initiative should be able to secure so good a representation of what is being produced in these three branches of industry confirms the reports that conditions are improving and that everywhere confidence is steadily returning. It will be the duty of every good citizen to safeguard these constructive tendencies against any further interruption.

Book Received

STATISTICAL MECHANICS WITH APPLICATIONS TO PHYSICS AND CHEMISTRY. By Richard C. Tolman. New York: The Chemical Catalog Co. Inc. Pp. 332. $7.00.

The Calendar

June 11–18	International Oil, Chemical and Colour Trades Exhibition.	Royal Agricultural Hall, Islington, London.
14	Röntgen Society: Silvanus Thompson Memorial Lecture. "Structure of the Atom and Radiation." Professor Sir J. J. Thomson. 8.30 p.m.	Royal Society of Medicine, 1, Wimpole Street, London, W.1.
15	Electroplaters' and Depositors' Technical Society: "Electro-refining of Silver." E. Downs. 8.15 p.m.	Northampton Polytechnic Institute, St. John Street, London, E.C.1.
14	Mineralogical Society. 5.30 p.m.	London.
15	Society of Glass Technology. 2.30 p.m.	Sheffield.
16	Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, Piccadilly, London.
16	British Chemical and Dyestuffs Traders' Association, Ltd.: Annual Meeting. 2.30 p.m.	Great Eastern Hotel, London, E.C.
17	Society of Chemical Industry and Institute of Chemistry (Newcastle Sections): Second Bedson Club Lecture—"The Photo-Synthesis of Naturally Occurring Compounds." Professor E. C. C. Baly. 6.30 p.m.	Armstrong College, Newcastle-on-Tyne.
24	National Physical Laboratory: Annual Visit of Inspection. 3 to 6 p.m.	Teddington.
29–30	North of England Institute of Mining and Mechanical Engineers: Annual General Meeting.	Newcastle-upon-Tyne.
July 1		
4–8	Society of Chemical Industry: Annual General Meeting.	Edinburgh.
Aug. 31–Sep. 7	British Association for the Advancement of Science: Annual Meeting.	Leeds.

Oil, Chemical and Colour Trades' Exhibition

Some Preliminary Notes of the Exhibits

The following notes give a general indication of what may be seen on some of the stands at the International Oil, Chemical and Colour Trades Exhibition which opens to-day (Saturday) at the Royal Agricultural Hall, London, N.1. The exhibition will continue open for one week.

Chemicals, Pigments, Solvents, etc.

HOWARDS AND SONS, LTD., of Ilford, are exhibiting an interesting range of solvents chiefly of the cyclohexanol type. Sextone, Sextone B, and Diacetone Alcohol are excellent paint and varnish removers, and are medium boiling solvents for cellulose lacquers. Sextate is a high boiling solvent and isopropyl acetate, which is also shown, is a low boiling solvent for the same purpose.

A wide range of samples of the many grades of fuller's earth prepared from the company's different quarries and mines in Surrey and Somerset is shown on the stand of the Fuller's Earth Union, Ltd. These are shown both in their natural state and in a variety of final products, from lump to fine powders, as marketed for various purposes. The company is also exhibiting a pure colloidal clay manufactured by the electro-osmosis process, and the refining and bleaching action of fuller's earth on oils is shown by samples of oils, including palm kernel, rape, cotton, nut, soya, etc., in the crude state and after treatment with fuller's earth.

Specimens of genuine Quicksilver Vermilion prepared by the George Atkinson branch of the firm are shown by Whiffen and Sons, Ltd., while alongside these samples is shown a specimen of pure sublimed Cinnabar.

The Manchester Oxide Co., Ltd., of Miles Platting, exhibit spent oxide obtained in gas purification and products derived therefrom, including prussiates of sodium and potassium in large and fine crystals, calcium-potassium prussiate, sulphocyanides, recovered sulphur, two more uncommon cyanogen derivatives, sodium nitro-ferricyanide, and sodium carbonyl-ferrocyanide together with mono-phenyl-thiourea. Prussian blues manufactured from the prussiates and copper pigments and basic ferric sulphate are also shown.

Plant for testing the fastness to light properties of lithopone are exhibited on the stand of Morris Ashby, Ltd., and samples both of lithopone, considerable improvements in the manufacture of which material have been made in the last few years, and of zinc oxide are displayed for the close inspection of those interested. Painted panels and ready mixed paint are exhibited, and samples of various grades of vegetable, lamp blacks and gas carbon blacks are also displayed. The firm is also showing "Gilsonite" in its raw state.

Strontium sulphate, which occurs in an almost pure state in Gloucestershire, and which, as a pigment or extender, is almost identical with barytes in its properties, is the exhibit of Strontium Products, Ltd., who state that, as the substance has a lower specific gravity than barytes, its suspension in oil is better, thus eliminating trouble due to settling in mixed paints.

Reckitt and Sons, Ltd., have put up a comprehensive show of ultramarine in many shades for various purposes, and the Building Metal Export Co., of Brussels, are displaying samples of white lead made by the Kalkhoff Process and several grades of red lead and litharge for which they are agents.

Wood rosin, which should prove of interest to varnish, paper size, and linoleum manufacturers, wood turpentine, Solvenol, pine oil and lacquers, products of the Hercules Powder Co., of Wilmington, U.S.A., are shown on the stand of Langley-Smith and Co., Ltd., who are showing all grades of foreign rosins and oils.

Saroul Universal Cleaner, solid lubricants, greases, soluble oils and paste, soaps and rosin oils are shown by Sandeman Brothers, of Glasgow, while Sandeman's Varnish, Ltd., has a stand showing varnishes of all kinds, driers, extra pale stand oil, enamel oil, enamel mediums and pale ester gums of low acid value.

J. W. and T. A. Smith, Ltd., are exhibiting a number of their manufactures presented in glass containers, the whole making a very attractive stand in which the large columns of chromes and the good assortment of lake colours show to advantage.

"Glossolar" gold and silver enamel, mixed and unmixed, aluminium silver paint, art and black enamels, and powder for these products are on view at the stand of J. Davies Allen, as well as stencil mediums, "Staneglass," window transparencies, and general accessories for lustre work. The Cornbrook Chemical Co., Ltd., shows a range of lake and fine pigments in lump form together with examples of finished articles coloured with their products.

Of special interest to cellulose paint makers is "Sacholith," made by the "Sachtleben" Akt.-Ges. für Bergbau und Chemische Industrie, of Cologne, which Andrews and Co., Ltd., are showing alongside some samples of lithopone and blanc-fixe.

Chemicals for antifouling, glass colouring, vulcanisation of rubber, reagents for the analysis of paints, etc., lubricating oil thickeners, paint-medium and varnish medium thickeners, chemicals for driers including cobalt salts, salts for the preparation of catalysis for oil hardening, mordants, etc., are to be seen on the stand of Thomas Tyrer and Co., Ltd., while Colin Stewart, Ltd., of Winsford, are showing their specialities in fine white silicas for the paint, colour, chemical, rubber, and other trades. They are exhibiting samples of raw materials, and finished products to meet the requirements of each particular trade. In addition they are showing a patent wood filler, and Manx spar for filtering, rough-casting and for monumental work.

The Building Trades Practical Laboratory, the proprietors of which are the Graphite Oils Co., Ltd., Grimsby, although manufacturers of paints, have devoted their stand to waterproofing preparations, making a special feature of their latest product, a red bitumen compound, known as "Protion," which they supply in liquid form for application to porous brickwork or tiles.

The extensive range of specialities for high-class decorative work in the home marketed by Chas. H. Betts and Co., Ltd., Birmingham, is well displayed on their stand, where the well-known "Bettsana" and "Cloissone" metallic paints and lustre powders are on view, together with brushes and other accessories.

Drums, Casks, and Metals

E. A. Brough and Co., of Liverpool, are demonstrating welding, showing particularly how a steel neck is welded to the top of a drum. On the stand is a display of various classes of drums, kegs, and tapers, including plain and corrugated drums, double hooped, and patent bevel edged, and particularly samples of drums subjected to test by independent bodies, including the Liverpool University.

Exhibits on the stand of G. T. Johnson and Co. consist of samples of a very wide range of steel containers. Drums and kegs particularly suitable for oil, paints, colours, and chemical goods form the principal feature. Alternative lids and closing processes may be viewed.

Thos. Firth and Sons, Ltd., Norfolk Works, Sheffield, are exhibiting a very comprehensive range of manufactures made from Firth "Staybrite" and stainless steels. Firth "Staybrite" steel, has a yield point of about 15 tons per square in. and an elongation of 55 to 70 per cent., which exceptional ductility is combined with maximum corrosion-resisting qualities. It may be cold-pressed to a degree far in advance of the so-called "stainless iron," and, moreover, it presents no difficulties in manipulation, since it can be subjected to the usual jointing processes without trouble. The exhibits demonstrate the extraordinary resistance of Firth products to the action of boiling acids and other chemicals, in addition to the corrosive action of paint. Numerous examples of chemical plant made from these materials will be on view.

S. Briggs and Co., Ltd., specialists in stainless steel, corronil, and monel metals, are exhibiting steam jacketed pans in these metals and in aluminium and tinned copper. They also show varnish pans in varying sizes.

Tools, Balances, and Containers

An interesting type of belt fastener is shown by the Mastabar Belt Fastener Co. The patented features of the "Mastabar" are the "hump" on the hooks, and the "bar" which couples up the hooks. The series of hooks is embedded into each end of the belt, and joined together with a thong of raw-hide or hemp. When the hooks are hammered home into the belt, the effect of the "hump" is to cause the hooks to become firmly fixed into the belt like a "barb." The hooks are thrown in a direction opposed to the longitudinal pull of the belt, with the result that instead of the strain of the drive pulling out the hooks, it tends to drive them still further in. The second feature of the "Mastabar" fastener is the "Master-bar" which joins the hooks together, which saves time in fixing, and also ensures that all the hooks are driven neatly into the belt, each in its correct position, whilst the bar is pressed below the surface, preventing any one hook from becoming detached from the series. The Mastabar fastening tool is also shown.

The exhibits on the stand of W. and T. Avery, Ltd., emphasise the progress brought about in weighing machine design by scientific research. Most of the scales exhibited call for only one hand operation and others, none at all. One scale will not give a weight indication at all if the single hand operation (a much simplified movement) is not executed correctly. Scales of interest to the trade, however, will probably be Nos. A771 and 45. The first (A77) can be set so that a run of containers can be filled to a pre-determined lock in quick time, without fresh settings of the scales. The second (No. 41) is a fully automatic liquid weigher, actuated by gravity, which requires no attention during weighing operations.

On stand 256, that of the John Dale Manufacturing Co., will be found a varied assortment of boxes and canisters made of tinplate, both plain and decorated, suitable for powders, pastes, or liquids. There are some very choice aluminium containers on view, particularly suitable for the perfumery and allied trades. Collapsible tubes and perfume sprinklers are also a strong feature with this house. Firms interested in putting up bottled goods will find an interesting display of the stoppers with composition heads which are now becoming popular. The stoppers may be had with specially embossed designs to suit customers' requirements and in all colours.

Belt fitting instruments are featured on the stand of the W. T. Nicholson and Clipper Co., Ltd. They are showing the improved "Klincha" belt lacing machine, with a new type of belt fastener, embodying many improvements in design which enable the machine to be held with one hand while a join is being made. The "Klincha" vice tool and mallet-tools are on view, as is the "Klincha" belt cutter, which cuts and squares belts with great accuracy to obviate strain when running. Belt cutting shears which hold the belt fast and prevent it from slipping down to the point, the "Python" file and tool handle, and a new type of belt cutter, with a circular knife, are also among the exhibits.

Grinding Machinery

On the stand of Buhler Brothers, of 9, Lavington Street, London, are exhibited four machines made by that company. The Four Roll Paint and Printer's Ink Grinding Mill has three grinding passages, and material is thoroughly ground with one operation. The large output makes the machine of interest to firms grinding big quantities of colours. The Three Roll Mill, a smaller machine for the same purpose, has self-aligning bearings, an improved method of oil ring lubrication, water cooled rolls, and a safety device on tension screws which prevents the breakage of rolls or mill frame in the event of a hard substance accidentally getting into the grinding passages. The Buhler Hammer Mill is used for dealing with dry colours and is capable of high speeds. The sieves can be changed in a few minutes. The Detacheur exhibited is used for the grinding and sieving of dry colour. Its speed is 2,800 revolutions per minute, and it is fitted with baffle plates that control the fineness of the resulting product. The special features of the Buhler Mills are forced lubrication, bearings of phosphor bronze in heavy cast iron housings, helical gears cut from the solid, ensuring quiet running, while the rolls are of highly polished chilled cast iron.

The grinding and pulverising department of International Combustion, Ltd., is exhibiting a working scale model of the Raymond Roller Mill, in which pulverising, elevating, and conveying are conducted in one operation. The unit itself is in closed circuit with air separation. The semi-ground material is lifted by a fan to the separator where grading takes place, the fines passing over to a cyclone, and the oversize or tailings falling back to the mill for regrinding. Grinding takes place between rollers and a bull-ring, and, as the material is thrown up by ploughs ahead of each roller, there is no direct metal to metal contact, thus making for low wear and tear. This firm is also showing photographs and literature dealing with other products, such as the Hardinge Conical Ball and Pebble Mills, the Hardinge Air Classifiers, Gayco Centrifugal Separators, Raymond Air Separators, Raymond Pulverisers and Hum-mer Electric Screens.

A 36 in. "Dreadnought" grinder, fitted with natural burr stones, a machine designed for all classes of fine grinding usually done on flat millstones, an "Impact" grinder, which will grind everything a disintegrator will deal with but with a greater degree of fineness, and a mixer and sifter are shown by W. S. Barron and Sons, Ltd. Working demonstrations on a five roller combination plant are made throughout the day at the stand of Marchant Brothers, Ltd., who exhibit also a high speed rotary disc grinding mill, rapid cone mixers, and paint and enamel straining machines.

Steel-Shaw Pulverising Cylinders for all kinds of minerals, chemicals, paints, etc., are exhibited on the stand of Steele and Cowlishaw, while Sidney Smith and Blyth, Ltd., are showing working exhibits of most of their specialities, including single, double, and triple roller mills, a combined plant, comprising one 30 in. twin horizontal mixer mounted over a 15 in. by 30 in. and 12 in. by 24 in. tandem two-roller mill, and a new two-roller mill which has been placed before the trade for the first time is also on view.

Paint and colour grinding mills of various sizes and two colour mixing machine are on view at the stand of H. Keller and Co. A machine that has been designed to meet the wants of all users of grinding machinery to prevent the damage done by the accidental entry of iron with the feed and to do away with costly system of hand picking usually needed, is embodied in an electro magnetic separator and automatic feeder which is shown by J. Harrison Carter, Ltd. On this stand there is shown also a mixer and kneader for moist and sticky materials, a vertical end runner mill for laboratory purposes, grinding and knibbling mills, and a general grinding mill.

Included in a representative display, Torrance and Sons, Ltd., of Bitton, are exhibiting their "Micro-Twin" differential refining mill and the "Silent Quadrant" triple roller mill, which has a micrometer arrangement for adjusting the roller, thus permitting any desired grinding pressure. Various sized mills and mixers are also on view.

Mixers, Sprayers, Pumps, and Fillers

Joseph Foster and Sons, of Preston, are showing several motor-driven mixers for various purposes. In the type "A" vertical mixer two sets of stirrers are provided revolving in opposite directions, one set being secured to a hollow outer shaft, the other to an inner shaft. The stirrers can be lifted out of the pan by means of a handle and direct coupled vertical shaft operating through gearing. Type "B" is similar, and the pan can be tilted on trunnions for emptying or can be be lifted away and a fresh pan substituted. In type "C" horizontal mixer two sets of stirrers revolve in the same direction.

William Gardner and Sons (Gloucester), Ltd., are exhibiting a large number of their latest machines including the well known patent "Rapid" sifters and mixers with essence sprayer for adding liquid essences, etc., to powders, ball mills of various types, grinding and dressing machines for producing various grades at one operation, a patent quick change dressing machine with removable barrel for easy changing from one mesh to another. The firm is also showing its "Rapid" dryers for removing moisture from powders and chemicals, a "Rapid" grinder and sifter which grinds and sifts at one operation, a special shredding and granulating machine for all kinds of wax and a new patent double agitator mixer for keeping lumpy moist materials in a granular condition.

On the stand of Attwoods' Spraying Equipment, Ltd., the exhibit consists of spraying units made by the firm, including type "U" pistol, type "U/S," with spreader nozzle, type "D," types "A" and "B" air brushes, all of which can be taken down and re-assembled without the aid of any tools. A feature of the "U" and "U/S" pistols is the use of aluminium wherever possible.

Automatic can, drum, and cask filling machines, net weight filling machines, apportioning machines for liquids, and other fillers are shown by the Roberts Patent Filling Machine Co.

A range of vacuum operated fillers, hand or power operated, either for powder or for liquids, are exhibited on the stand of the Albro Fillers and Engineering Co., Ltd., and Harry Heymann, Ltd., are exhibiting their "Monopol" and "Culminex" syphons, a vacuum pump for use with the syphons and a special lift for indicating the levels of liquid in vessels.

A wide range of filter papers and filter pulp, with and without asbestos, manufactured by T. B. Ford, Ltd., are shown on the stand of Alfred K. Wright and Co., These have been produced after careful study of the particular requirements of the oil, chemical, and colour trades, also of beer and vinegar brewers, wine and spirit bottlers, maltsters, sugar refiners, etc.

The rotary air compressor or vacuum pump exhibited by Bernard Holland and Co. will, when used as an air compressor, deliver 800 cubic feet of free air per minute at pressures up to 60 lb. per sq. inch, and when used as a vacuum pump has a theoretical displacement of 820 cubic feet of free air per minute suitable for maintaining a vacua up to 95 per cent. of the barometer. Machines of this type are constructed in 21 sizes ranging from 14·6 cubic feet per minute to 4,000 cubic feet, and can also be supplied as two stage machines for creating pressures up to 200 lb. per square inch and vacua up to 99·5 per cent. of the barometer. The machine exhibited is of the water cooled type, but a smaller type, air cooled, is also made. A small rotary air compressor or vacuum pump of 20 cubic feet capacity and examples of the Deville petrol, paraffin, or gas engine, in sizes up to 14 B.H.P., suitable for industrial drives, etc., are also exhibited.

A 55 H.P. "Blackstone Spring-Injection" crude oil engine, complete with a new type fuel heater and purifier and a combined petrol engine and compressor are on view on the stand of Blackstone and Co., Ltd., of Stamford.

Automatic continuous working oil expellers, crushers, and hydraulic pressing plant are in the exhibits of the Utrechtsche Machinefabriek O.D. Frans Mulders.

Research in America: Progress on Catalysis Problems

From a Princeton Correspondent

On Thursday, May 12, the foundation stone of the new chemical laboratory was laid at Princeton (U.S.A.) University in the course of ceremonies in which the Governor of New Jersey and other distinguished visitors took part. With this step the practical attainment of a scheme of some years' planning was commenced, by which modern housing and equipment will be provided for the oldest chemical tradition of any University in the United States. The study of the science at Princeton dates from 1795, when a young Scotsman, Dr. John MacLean, was appointed to the newly created chair of chemistry, the first to be established in the country.

If America has in recent years experienced an ever-increasing material prosperity, the lavishness with which her wealthy citizens and business corporations have endowed scientific research has been no less remarkable. Such institutions as Princeton, which have enjoyed this practical support, have not been slow to take advantage of it, and the completion of the new laboratory has for some years been the ideal of the present professor of chemistry, Dr. William Foster.

The rise of Princeton in recent years, as a centre of graduate research work of outstanding significance, has taken place in particular since the appointment to the faculty, in 1914, of an Englishman, Dr. Hugh S. Taylor, who was introduced, as instructor in physical chemistry, by the head of the department, Professor G. A. Hulett—an appointment which he has since described as "the best thing he has ever done for Princeton." Dr. Taylor, of course, has since achieved an international reputation for his work on catalysis problems, being the joint author with Dr. E. K. Rideal, of Cambridge, of a standard book on *Catalysis in Theory and Practice*, of which a new edition has recently been published; while some notes on his researches appeared in THE CHEMICAL AGE for August 7, 1926.

His latest investigations are dealt with by Professor W. D. Bancroft, of Cornell University, in a paper just published in the Princeton *Alumni Weekly* in connection with the foundation of the new laboratory. In this it is stated that Dr. Taylor is now taking the lead in American researches on mathematical photochemistry, being chairman of the Committee on Photochemistry of the National Research Council, which is at present functioning much as the committee on contact catalysis does and which will soon publish a very elaborate report. Since the light from the sun is what keeps life going on the earth, the fundamental importance of photochemistry is very great. Actually, we are a long way from either chemical or photochemical production of life, and we have made very little progress in the much simpler problem of converting light efficiently into work. Photography is still the only form of photochemistry which appeals very much to the general public as yet; but it is one of the intentions of the committee to change that.

"In photochemistry as the chemist understands it," Professor Bancroft continues, "there are two quite distinct fields of work which correspond in principle to the difference between the inorganic and organic chemistry of forty years ago and the physical chemistry of to-day. There is the descriptive side and the mathematical side. We can study what the end-products are and why, or we can study the course of the reaction, after the fact of the reaction and the nature of the end-products are known. We can find out what the latent image is in photography and why blue copper sulphate is not sensitive to light while vermilion is, or we can study the relation between the amount of light which is absorbed and the amount of hydrochloric acid, for instance, which is formed photechemically from a mixture of hydrogen and chlorine gas."

The second, or mathematical, part of the subject is what appeals chiefly to Professor Taylor, and Princeton is now easily the leader in this field in the United States. Fifteen years ago Einstein put forth the so-called photochemical equivalent law, which, stated in its baldest terms, says that, in a photochemical reaction, one quantum of active light is absorbed per molecule of absorbing and reacting substance which disappears. This law holds for a number of cases, as has been shown by many people, including members of the Princeton laboratory. On the other hand, with hydrogen and chlorine there are perhaps 100,000 molecules which react per quantum of light absorbed. The only way to save the Einstein theory is to postulate that this reaction takes place in at least a hundred thousand stages and that the Einstein formula describes the first stage. Then it becomes necessary to discover what the other stages are in the so-called "chain mechanism." This is still an unsolved problem; but the Princeton laboratory is doing intensive, and obviously fundamental, work on the whole question of chain mechanisms. "As a somewhat cynical outsider," says Professor Bancroft, "I have suggested to Professor Taylor that he consider the other alternative, that perhaps the Einstein formula does not apply even theoretically to all photochemical reactions. If he tries out this suggestion, the Princeton laboratory will win either way."

Continuing, it is stated how Cario and Franck in Germany found that, when a mixture of mercury vapour and hydrogen was exposed to light, some of the light which was absorbed by the mercury caused an activation of the hydrogen, presumably because it decomposed the hydrogen molecule into hydrogen atoms. This work has been extended and amplified by Marshall and Taylor, who have shown that "hydrogen atoms produced by Wood's method, the passage of a powerful high tension discharge through molecular hydrogen at low partial pressures, will produce hydrogen chloride when led into unilluminated chlorine."

The Position of I. G. Shares

A German Analysis

FOR obvious reasons, the position of the shares of the I.G. in the German money market is of special interest. The following is translated from a note which appeared in the *Chemiker-Zeitung* for June 1 :—

" Last year (states the *Chemiker-Zeitung* note) we published warnings from an authoritative source of an unhealthy rise of Bourse prices. Confidence in the Bourse, and the inclination of the German public and of foreign capitalists to concern themselves in German industrial undertakings (especially also in chemical companies), can too easily be converted to mistrust by unnecessary fluctuations, if objective criticism does not sink in. The non-expert capitalist, who wishes to obtain interest, not to change his capital investments, and not to live by quotation changes, must, in regard to each share, ask himself the following questions.

" As a basis for consideration, the shares of the greatest German industrial undertaking, the I.-G. Farbenindustrie A.-G., will serve, since the latter has such many-sided sources of profit, and is therefore not so dependent on a few products and on their market position. These shares were, in 1926, the leading ones on the German Bourses, and will probably remain so. The valuation of this giant undertaking ought not to rise above the assets, but its significance for German political economy as a whole should make the I.G. shares the reliable standard stock of the market.

Dr. Duisberg's Warning

" Since the chairman of the I.G. board, Dr. Carl Duisberg, a short time ago warned Bourse circles against exaggerated optimism, it may be asserted that a quotation of 250 to 300 per cent. has by price valuation already, in advance, strongly discounted the future prospects of the I.G. shares. In May, 1926, the I.G. had a quoted capital of about one thousand million Reichsmarks (1 milliard R.M.), at the end of June about 1½ milliard R.M., at the end of September about 4 milliard R.M., and since then from 3 to 3¼ milliard R.M.—recently about 3 milliard R.M. If we optimistically assume that this well-conducted and many-sided undertaking (with future prospects already discounted by the Bourse) is just as safe as a capital investment in State loan, which brings in about 5 to 5¼ per cent. interest, then a quoted capital of 2, 2½, 3 and 4 milliard R.M. respectively demands, at 5 per cent. interest on the market value, not less than 100, 125, 150, and 200 million R.M. per year in net receipts and distributed dividends. On the other hand, the profits in 1925 and 1926, after heavy writing-off, amounted to the very imposing sum of 54¾ and 68·70 million R.M., which were not, however, very high for such a market quotation.

" Even if for the year 1927 100 million R.M. should be divided, the small capitalist would receive interest at the rate of about 3 per cent., 3¾ per cent., 4 per cent., and 5 per cent. respectively on purchase prices of 350, 300, 250, and 200 per cent. As the administration of the I.G. is striving to supply Germany with cheap nitrogenous fertilisers and fuels, it can hardly abandon its cautious dividend policy. Even assuming a dividend of 15 per cent. for 3 or 4 years, if international price agreements, especially with England, America, France, and Italy, as Japan and China, result and have worked themselves out, there is then yielded by this reliable standard stock, at a purchase price of 300 per cent., an interest of 5 per cent. on capital. It is, however, rather to be assumed than otherwise that the company will only slowly accelerate the rate of dividend increase, since in the chemical industry constant advances necessitate large writing-off. There may be adduced, for example, the present world-overproduction in petroleum and benzine, which leads to low prices, and naturally has strong influence on the I.G. liquefied-coal-products as regards prices. In the same way, there are, in general, hints in foreign countries of a gradual world-overproduction in nitrogen products. Moreover, it seems that a capital of 1,100 million R.M., upon which a cautious administration will regularly pay a good interest, cannot be permanently increased by ' watering.'

" The capitalist, therefore, who buys these and similar reliable shares at a high market price, runs indeed no risk, but must for the present and perhaps for years reckon on a low yield on his capital. If he can withstand market fluctuations, his property is, on human assumptions, of lasting value; under some circumstances an increase in market value may again occur, which on sale of the shares neutralises the low interest. But capitalists to whom lasting possession is desirable, even after years receive on the shares (optimistically driven by the Bourse, in spite of the warnings of authoritative administrations, to too high a value) hardly a higher rate of interest than if from the first they prefer 5 to 6 per cent. investment values. These considerations ensue in the interests of the necessary stable economic development of Germany, and in regard to the great difficulties which the modern development of German chemical industry, in spite of all advances, or even on account of competing advances in all lands, has still to overcome."

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published ; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries :—

53 (*Chemical Plant*).—" We should be glad if you would supply us with a list of firms who make plants for chemical works, especially for making saltpetre acid, ammonium nitrate, ammonium sulphate, and sulphuric acid. The following plant will also be required :—Air compressors, fans, exhausters and drying plant, acid centrifugal pumps, acid-proof steel, cooling plant, steam compressors, automatic weighing machines."

54 (*A Rust Solvent*).—" We should be obliged if you could give us any information about a solvent for rust which we understand has been put on the market recently. We believe that this substance dissolves rust easily, and would like to know its name and where it can be obtained."

Replies

47 (*Quellin, May 28*).—We are informed that James Eastwood and Sons, Ltd., 14, Market Place, Manchester, and Joseph G. Watson (Manchester), Ltd., 4, York Street, Manchester, are agents for this commodity and can supply small or large quantities.

The Structure and Uses of Stabilised Bitumen

WE have received from D. Anderson and Son, Ltd., a pamphlet entitled " A Treatise on the Structure and Uses of Stabilised Bitumen," which deals with research into the properties of ordinary bitumen and the subsequent production of stabilised bitumen.

In the first part it is stated that research has shown that ordinary bitumen is cellular in structure, and the gases present in the cells show signs of movement under the action of light and heat.

" In promoting the various specialised preparations now on the market much has been made of the fact that bitumen has colloidal properties . . . due to the fact that the elementary carbon content is present in bitumen as a colloid. . . . Obviously the retention of a colloidal state in bitumen is an essential factor in keeping the material elastic and ductile."

For this reason, states the pamphlet, our efforts have been directed to retaining all the protective qualities of bitumen, while preventing it from losing its ductility and from coagulating after application on any surface. After long experiment we found that the addition of a small percentage of one particular colloid carrying dispersive agents had a remarkable effect on the whole structure of bitumen. The action of the colloid in question is remarkably rapid, comparable in a degree to the action of yeast in dough. The structure is almost metamorphosised. From an open cellular construction it assumes a consolidated state, the latent gases are dispersed, light coagulation and decolloidification are found to be arrested, and, in consequence, bitumen attains a stabilised condition uniform in physical characteristics."

This has resulted in the production of a stabilised bitumen known as " Stablex," which, it is claimed, is resistant to sea water, sea air and acid in suspension in the atmosphere, to nitric and sulphuric acids and also to acetic acid, which experience has hitherto found ready to disassociate the bitumen molecules. Temperature changes are said to have little effect on the material.

Indian Chemical Notes

(From Our Indian Correspondent.)

The Government of Mysore have taken another step in the advancement of the chemical industry in the State. An alcohol refinery has now been added to the already existing wood distillation plant at Bhadravati to convert the crude methanol obtained as a primary by-product into refined or C.P. methanol. The plant is designed to treat 1,000 gallons of crude alcohol per day. The production of refined products with reference to crude alcohol treated is as follows :—C.P. methanol 60 per cent., methyl acetone 12 to 16 per cent., finished allyl 3 to 6 per cent., and oils from 0 to 10 per cent., according to the oil content of the crude alcohol. In India, before the war, methanol formed a general denaturant. The war having cut off foreign supplies, the formula for denaturing was revised so as to substitute pyridine and caoutchoucine. Since the Mysore produce began to appear it is understood that it has been recognised as a denaturant for industrial spirits.

Printer's Ink Experiments

The experiments conducted by the Industrial Chemist to the Madras Government in the Government Industrial Institute, on the manufacture of printer's ink, show encouraging results. The large volume of imports appears to justify such an industry. The five ingredients used in the manufacture are carbon black, linseed oil, rosin, soap and a blue pigment. Of these all are easily obtainable in India except carbon black, which is imported from America. The materials have had to be ground by manual labour with stone slabs and rollers, but the results of the preliminary laboratory experiments have been such as to justify the purchase of mechanical mixing and grinding apparatus. The varieties of printing ink on which experimental manufacture has been concentrated are "news ink" and "book ink," and the experimental products so far resulting have given satisfactory results.

Glycerine Manufacture

Experiments carried out in the Kerala Soap Institute, Madras, have resulted in the production of a satisfactory quality of 80 per cent. concentrated crude glycerine as a by-product from the soap lyes, and the question of developing a market for the crude glycerine is receiving close attention. Last year, the glycerine plant was in operation throughout, and glycerine to the value of Rs. 4,000 was sold. The output of glycerine is directly dependent on the extent of the production of boiled soap, and when the soap factory is working at its full capacity a very satisfactory revenue should accrue from the sale of this by-product. A good deal of useful data in regard to the modification of the established process of glycerine recovery to suit Indian conditions has now been obtained.

Mysore Lac Experiments

A recent report from Mysore states that lac cultivation is proceeding satisfactorily in Mysore. During last year 10,100 trees were enumerated and 2,650 trees were pruned. One hundred pounds of brood lac were sent to the Chief Forest Officer, Coorg, for experimental purposes. Attempts have been made to manufacture polish out of lac dust and the experiments performed thereby proved most successful. Much progress has been made in the manufacturing of sealing wax, as successful results attended the previous experiments. Experiments conducted to manufacture boot polish from lac waste have also given fair results.

Cyanamide as Manure

The tendency in India is for indigenous manures like fish, bones, and oilcakes to rise in price year by year, owing to the demand for them in Ceylon and Europe. They have now reached a price at which the ryot is unable to use them economically for his low-priced crops. The Department of Agriculture in Madras has therefore been giving a good deal of attention to calcium cyanamide, since there is a possibility of making this in large quantities by means of hydro-electric power, which is being developed in the Presidency. The results of the past three years' work on this subject have shown that at Coimbatore the application of one cwt. of cyanamide in conjunction with one and a half cwt. of superphosphate to paddy results in a net profit of Rs. 31 per acre, and further that it does not pay to increase the quantity of cyanamide.

Other Manures

Sodium nitrate is another possible source of nitrogen, and investigations thereon indicate that from the ryot's point of view green leaf manure is either more profitable than either sodium nitrate alone or in conjunction with green manure, and the prospects for the economical use of this fertiliser seem to be limited. Field experiments with Trichinopoly phosphate have given promising results, and this work will be continued to discover the best combination in which to use this indigenous source of phosphate. The best manure to use, however, is cattle manure. The difficulty is to get enough of it.

Nitrogen Fixation

Experiments at the Agricultural Institute at Pusa have shown that under certain conditions nitrogen fixing bacteria become very active, adding to the soil large quantities of nitrogen, which is, however, easily lost unless conditions are such that it is nitrified and taken up by a growing crop. In these experiments the estimations of total nitrogen were taken, to a depth of one foot and of nitrates to a depth of three feet, in four fallow plots, two of which got a dressing of farmyard manure, during a period of three years. The decomposition of a compost of mustard cake is hastened if a quantity of charcoal equal to 5 per cent. of the weight of cake is added. Not only is the efficiency of the resultant manure increased, but the objectionable odour of the fermented cake is considerably modified. Similarly when six per cent. of charcoal is added to a bonemeal-sulphur-sand compost, the solubilisation of phosphoric acid is more efficient and proceeds for a longer time.

Industrial Alcohol

A proposal has been made to the Government of Bombay that it should begin to manufacture industrial alcohol in the big distillery at Nasik. At present, the distillery produces liquor to meet the whole demand of the Bombay Presidency. But the distillery is so large that at present only one-third of its capacity is utilised. Therefore, if industrial alcohol can also be manufactured (which can be done very easily), considerable profit should be made. The imports of industrial alcohol from Java are now very large and show the scope for the development of the industry in India.

Mica

The output of mica increased by 5,000 cwts. to 46,000 cwts. A more accurate idea of the industry can be had from the export figures. In 1924 the exports amounted to 70,000 cwts., valued at Rs. 94 lakhs. In 1925 the exports amounted to 99,000 cwts., valued at Rs. 106 lakhs. The output of jadeite decreased from 2,600 cwts. to 1,700 cwts. There was a marked fall in the price, which was due to the outbreak of civil war in China, which is the only important market for jadestone exported from Burma. The production of chromite during the year decreased from 45,000 tons to 37,000 tons.

Indian Steel Casting Industry

The Indian Tariff Board recorded further evidence at Calcutta in regard to the steel casting industry and its need or otherwise for protection. It may be mentioned here that the Tariff Board in its last report was unable to make any recommendation in regard to steel casting, because the Government was not able to state its exact demands for wagons. The question of protection to steel castings is closely bound up with the manufacture of wagons. The representatives of the Hukumchand Electrical Steel Works, who appeared before the Board, stated that since 1924, when the question of protection was first investigated, the demand for steel castings in India has increased considerably owing to the increased production of wagons under the bounty system. On this ground principally the company based its claim for protection. According to them the necessary raw material could be raised in sufficient quantities in India not far distant from their works, and the present quality of their castings was considered satisfactory. The witnesses were not able to furnish their quotations regarding prices, but said they would furnish the same in due course. S.G.W.

Pipe Jointing Materials

By Antony Seton

A NOT infrequent cause of trouble in works is leakage at joints and other places in pipe lines where the continuity of the conduit is broken by the insertion of valves and other fittings. The selection of the proper material for jointing is not to be made haphazard. Often it is left to the workman either to use anything that lies to his hand or else to avail himself of some patent preparation which he thinks fit, whether or not it is suitable for the type of joint it is desired to make. Jointing materials may be divided into classes according to the conditions under which they are to be used. The type of jointing paste suitable for a gas main, for example, would be quite unsuitable for a steam main carrying steam under considerable pressure, and what would serve for hydraulic mains would be useless for gas. Pipes conveying acid and corrosive liquors require materials of entirely different calibre, differing very greatly from that used for ordinary water pipes.

For joints in all pipes, but for steam pipes especially, it is good practice to have a small boss provided for facing instead of making the joint over the whole flange. In small pipes it is not a great matter, perhaps, to face a whole flange, when the outside diameter is possibly not more than 4 in., but when the diameter is in the neighbourhood of 12 in. or more, to secure a bearing over the whole face is an expensive matter.

Joints in Steam Pipes

In the joint in locomotive cylinders (two castings being bolted together to form a complete unit) some of the railway companies make use of two semicircular grooves, one in each casting, running the whole length of the casting, which meet and form a circular groove about $\frac{1}{8}$ in. in diameter. The castings are bolted together and the grooves are filled with a mixture of cast iron borings and ammonium chloride, just moist enough to bind. The borings rust quickly and a steam tight joint is formed. For small steam pipe joints, as in central-heating installations, a mixture of the following composition has been recommended: iron borings, 80 to 100 parts; flowers of sulphur, 1 part; ammonium chloride, 1 part. The borings should be sifted before mixing, and the mixture wetted down to a paste two hours before use, no more being mixed than is likely to be used. Not less than two days should be allowed for a three inch pipe to set.

For a similar purpose yarn soaked in red lead paint is sometimes used. It has been suggested that a mixture of two parts of slaked lime with one part of lead oxide (minium), made into a putty with linseed oil and caulked with alternate layers of yarn, serves equally well.

Joints for Water and High Temperature

For joints exposed to water and high temperatures, sheet asbestos may be soaked in linseed oil for six to eight hours, and after drying for 24 hours may be dusted with graphite before use. This makes a sound joint which does not always break when taken down. Of a similar nature is a joint in which sheet asbestos is painted with a preparation of manganese dioxide and linseed oil. Rubber sheet covered with graphite makes a good steam pipe joint, but requires tightening up when steam has been admitted to the pipe. The joint is perfectly hard when it has been tightened up. For screwed joints the manganese dioxide preparation just referred to is excellent. Red lead paint is often used, but is not so satisfactory. A mixture of pine tar and ferric oxide (rust) is better than red lead, as it does not harden so soon, and is more adhesive under pressure.

For very high temperature steam joints a compressed asbestos packing is on the market which consists of specially picked asbestos yarn soaked in oil, and containing a large proportion of graphite. There is no blowing out with this packing. Small leaks in steam pipes can be stopped with a paste made of manganese dioxide and linseed oil. The paste hardens quickly and forms a good seal. In the cylinder joints of internal combustion engines graphite and paraffin may be mixed to a paste and applied to both sides of thin sheet asbestos. This is good also for the joints of exhaust and induction pipes. Crank case joints may be made with brown paper if the castings have been faced up properly. If carefully made these joints can be absolutely oil tight.

Rubber reinforced by canvas can be used for pipes conveying ammonia, and rubber sheet generally can be used for pressures up to 100 lb. per square inch and temperatures up to 350° F. Satisfaction may be obtained above these figures, but unreinforced rubber is not recommended above the limits named.

In making any joint it is essential to have the surfaces as clean as possible, and as free as may be from bad surface defects such as may be made by chipping off the old joint carelessly. The aim should always be to make the joint with as thin a separating sheet as possible. The joints made by the aid of lead or copper rings have not been mentioned, because these require no attention provided the rings are a good fit in the grooves cut for them. The joint is made actually by the squeezing out of the soft metal (copper or lead) by the pressure obtained when the bolts are pulled up. When renewing such joints care must be taken not to break away the sides of the groove in which the ring fits, or a leaky joint will result.

Wool Research at Leeds University

THE Textile Department of the University of Leeds has been working on wool, and data have been secured which, it is hoped, should have considerable influence on the control of quality. The chemical branch of the department has been measuring differences both in the honeycombe structure and in the fluid medium of the cells of different qualities of fibre. The best wools are the most supple, most easily workable, and have the most fluid medium. Oils play an important part in the preparation and working of wools and worsted, and another line of research at Leeds University has had to do with these. The main function that wool-oils are supposed to serve is that of lubrication to facilitate the passage of the fibres one over another in combing and carding. The lubricating quality of wool-oils varies very much. Experiments have been carried out with a view to finding a cheap, yet entirely satisfactory, lubricant, and this is said to have been found, a blend having been obtained which is a first-rate lubricant, and at the same time less costly than many of the existing oils on the market. The results will be published in due course.

Manufacturing Chemist's Affairs

A MEETING of the creditors of William Watson, of 1A, Lomax Street, Rochdale, and also trading as Hall and Provan, of 43, South Lane, Rochdale, manufacturing chemist, etc., was held recently at the offices of Arnold Watson and Co., 4, Cannon Street, Manchester, when the representative of F. Hunter and Co., the principal trade creditors, was elected to the chair. The statement of affairs presented showed ranking liabilities of £20,789 1s. 5d. The assets were estimated to realise £14,753 11s. 10d., from which had to be deducted £156 11s. 8d. for preferential claims, leaving net assets of £14,597 0s. 2d., or a deficiency of £6,192 1s. 3d. During the discussion which took place a number of creditors spoke highly of the debtor and sympathy was expressed with him in his present position. A resolution was passed confirming the deed of assignment already executed to Mr. A. A. Yorke, of Arnold Watson and Co., whilst a committee of the principal creditors was also appointed.

Old London Tours

A LARGE number of applications have been received for participation in the tours to various places of interest in London, under the guidance of Mr. Allen S. Walker, the well-known archæologist, which have been arranged by THE CHEMICAL AGE. As there has been some concentration on the later dates, there are still a few vacancies for the tour on June 21, when a visit will be paid to the Temple, the Temple Church, the Middle Temple Hall, and the Inner Temple Hall. Readers who desire to attend on this date are requested to send in applications at once to THE CHEMICAL AGE, Bouverie House, Fleet Street, London, E.C.4. The party will assemble at Bouverie House at 2.45 p.m., and return at 5.30 p.m. for a cup of tea.

Mixed Fertiliser Manufacture in France

THE Etablissements Kuhlmann are reported to be planning the raising of a credit of 15 million Swiss francs for the purpose of erecting, together with several other companies, large plants for the production of atmospheric nitrogen and mixed fertiliser in France and Belgium. It appears that this development may be regarded as a consequence of the presence of Mr. Rosterg, general manager of the Wintershall concern, at the recent negotiations in Paris, who may have suggested this plan for the construction of mixed fertiliser works and the development of the nitrogen plants already existing. As is known, atmospheric nitrogen products are produced at the Kuhlmann plant by the Claude process, which is also going to be used in the nitrogen works at Klöckner. Although the amount of 15 million Swiss francs, corresponding to about £600,000, does not seem to be sufficient for the erection of large plants, the Etablissements Kuhlmann are well situated financially at present, so that the financing of this building programme will hardly meet with difficulties. It appears that difficulties may much rather be expected in technical respects, at any rate at first. The process for the production of hydrogen from the blast furnace gases and the production of atmospheric nitrogen products under pressure (the Claude process) has been tried out by the company; the oxidation of the ammonia to nitric acid is also being carried out without difficulty. However, the production of potassium nitrate, potassium ammonium nitrate or the potash-nitrogen-phosphorus mixed fertiliser will require a considerable amount of investigation, and it may well take one or two years before a sufficiently good product can be marketed, even if construction of plant is commenced at once.

New Fertiliser Laws in California

Two laws affecting the sale of fertilisers have been enacted in California. One of them authorises the Director of Agriculture, after a hearing, to cancel the registration of, or to refuse to register, any manufacturer or dealer who sells or offers for sale any commercial fertiliser or material which is detrimental or seriously injurious to plants, when applied as directed, or which is known to be of little or no value for the purposes for which it is intended, or for which untrue or misleading claims are made. The other law requires a personal licence in order to sell or deal in fertilisers. Every application for a licence must be accompanied by the recommendations of two freeholders within the county certifying that the applicant is "honest, truthful, and of good reputation." Each member of a partnership, each officer of a corporation, and each agent and employee engaged in the business of selling fertiliser as a whole or partial vocation, must obtain a separate licence. The licences expire with each calendar year. The licence fee is $2.00 for the first licence required by each concern and $1.00 for each additional licence. The California Fertiliser Association endorsed both of these Bills and worked for their enactment. The Bills were also approved by farm organisations and agricultural authorities. They are expected to bring about improved relations between the agricultural and fertiliser industries. Both Bills become effective August 1, 1927.

I.G. Dividend and New Capital

A 10 PER CENT. dividend was declared at a general meeting of the I. G. Farbenindustrie A.-G., on Thursday, June 2, at Frankfort. There was some dissatisfaction among a minority of shareholders, who regarded the dividend as low in relation to the present high price of the shares. The I. G.'s new coal liquefaction plant at Merseburg was stated to be in operation. Although it had last year seemed probable that a reduction in staff would become necessary, it was stated that the number of employees (including officials) had increased by 2,500. The wages of the workers averaged 2,167 marks (£108 7s.), as compared with the pre-war level of 1,400 marks; and of the officials 4,940 marks (£247), as compared with the pre-war 2,845 marks. A Berlin message states that the I. G. has obtained permission to introduce £10,554,000 new shares on the Berlin Bourse, to finance various developments.

New Catalogues

THREE new catalogues have been issued by Baird and Tatlock (London), Ltd., of 14–15, Cross Street, Hatton Garden, London. Technical Research Series No. 3 (pp. 44) deals with apparatus required for the testing of petroleum products, and includes all the apparatus adopted as standard by the Standard Committee of the Institution of Petroleum Technologists for many tests on gasoline, white spirit, kerosene, gas oil, mineral lubricating oils, transformer and switch oils, fuel oils, asphalts, wax, and crude petroleum. Technical Research Series No. 5 (pp. 136) deals with the analysis of coal and its by-products. This, in view of the importance of adhering to standard apparatus and procedure, contains all such standardised apparatus, made to the specified design of various bodies and embodying all the latest improvements. There are sections on apparatus for coal analysis; ultimate analysis; determination of caking index and calorific value; low and high temperature assay of coal; examination of inorganic matter in coal; examination of gases; by-products—oils; examination of tars, pitch, benzole, naphthas and light oils, carbolic acid, anthracene, pyridine; water analysis, etc. As a guide the catalogue contains references to and excerpts from the standard methods, and a selection of books. Standard Catalogue, Vol. III, 1927 edition (pp. 501), deals with the biological sciences, including biology, zoology, bacteriology, microscopy, agriculture, hygiene, etc.

New L. and N. Developments

UNDERWRITING arrangements have, it is stated, been concluded for the issue of £150,000 first mortgage convertible debenture stocks in the "L. and N." Brown Coal, Ltd. The company has been formed to purchase 420 acres of valuable land at Morwell, Victoria, Australia, containing a proved deposit of more than 400,000,000 tons of brown coal. The company is, as a preliminary, to mine and sell 1,000 tons of raw brown coal per day, and later to distil the brown coal by the "L. and N." process and market the oil and residual fuel. The directors are Lieut.-Col. J. T. C. Moore-Brabazon, M.P. (chairman and joint managing director of the "L. and N." Coal Distillation Co., Ltd.), the Hon. Theodore Fink (chairman of the *Melbourne Herald, Weekly Times* Co., Ltd.), Sir James Simpson (director of General Accident, Fire and Life Assurance Corporation, Ltd.), Frank Middleton (deputy-chairman Old Silkstone Collieries and its associated companies), Bryan Laing (managing director, Sensible Heat Distillation Co., Ltd.). The company possesses the Australian rights of the "L. and N." distillation process. There will be no public issue.

Acetylene and Welding Association: Annual Meeting

AT the annual general meeting of the British Acetylene and Welding Association, held in London on Thursday, June 2, Mr. Alexander Jackson, of Carbic, Ltd., was elected president for the year 1927-28. The vice-president is Mr. Albert Hoddle. Mr. Jackson has served as president on two former occasions. During the past year consideration has been given to the Petroleum Act, 1926, which alters very considerably the official regulations with regard to the licensing of stores. It was pointed out, at the meeting, that local authorities are now at liberty to vary the conditions or make special conditions with regard to storage, and that some are enforcing conditions with regard to the storage of carbide which are antiquated. The Association is now on the point of taking up with the Home Office the question of the amendment of such conditions.

Empire Cotton Growing Research

IN the report of the administrative council of the Empire Cotton Growing Corporation, presented to the annual general meeting of the Corporation held recently, an account was given of the work done during 1926. On the biochemical side, it was stated that at the Rothamsted Experimental Station Dr. Crowther, after working for some months on soil investigations at the Gezira Research Farm, in the Sudan, was continuing his experiments on the biochemistry of the nitrogen in samples of soil sent home from the Gezira.

From Week to Week

THE CHEMICAL CATALOG CO., INC., has changed its address to 419, Fourth Avenue, 29th Street, New York City.

MR. D. MAXWELL BUISH, assistant to the Hull Corporation electrical engineer, has accepted the post of chief electrical engineer to Synthetic Ammonia and Nitrates, Ltd., Billingham, Stockton.

AUTOMATIC AND ELECTRIC FURNACES, LTD., London, announce that they have entered into an arrangement with G. Blundell and Co. of Yokohama for the sale of their Wild-Barfield electric furnaces in Japan.

EXPORTS OF INDIGO FROM INDIA during March amounted to 118 cwt., as against 179 cwt. in March 1926. Persia and Mesopotamia took 51 cwt., Japan 30 cwt., Egypt 18 cwt., and other countries 19 cwt.

THE SOCIEDAD QUIMICA MEXICANA is the designation of a new chemical society which has been formed in Mexico, the first president being Dr. F. Lisci. The society will publish a journal to be known as the *Revista Chimica*.

PROFESSOR V. N. IPATIEW, the famous Russian organic chemist, recently completed 35 years of scientific activity. A special celebration of the occasion, organised by the Scientific and Technical Institute of the U.S.S.R., was held in Moscow on Sunday, May 15.

A CONCRETE PROOF OF THE ADVERSE EFFECT of synthetic methanol on the German wood distillation industry is shown by the report that two wood distilling plants, situated at Hochspeyer and Amoneburg, are offered for sale by the Holzverkohlungs Industrie A.G.

APPLICATIONS ARE INVITED for the following appointments: A biochemist for the East Malling Research Station, near Maidstone, Kent. The Secretary. June 30.—The Moseley and Mackinnon Research Studentships of the Royal Society (£300 per annum each). The Assistant Secretary of the Royal Society, Burlington House, London, W.1. June 22.

THE AMERICAN GLANZSTOFF CORPORATION will start work in a few weeks on an artificial silk plant near Johnson City, Tennessee. The first cost is to be $7,000,000, but ultimately extensions are to be made which will bring the cost to $50,000,000. The company is controlled by Vereinigte Glanzstoff Fabriken, of Elberfeld, Germany, and produces artificial silk by the acetate process.

DONATIONS AMOUNTING TO £250 were received by the committee formed to found a memorial to the late Mr. F. S. Spiers, secretary of the Faraday Society and the Institute of Physics. The interest on this fund is to be available for the payment of an honorarium to a lecturer on some subject in physical chemistry, the lecture to be given once in three years and to be called the Spiers Lecture. The Faraday Society has undertaken the administration of the fund for this purpose.

BRANSTON'S ARTIFICIAL SILK COMPANY is now equipping a large factory at Burton-on-Trent which has been acquired from Crosse and Blackwell, and by the recent fusion with Harbens has secured the technical co-operation of that company, thus avoiding the pitfalls awaiting a new concern working an intricate process. The Branston company aims at an initial output of four tons a day, with an expansion later to 16 tons a day, cheapness of production being regarded as the basis of success.

AT THE INQUEST on Saturday night on Mr. Arthur Bennington Reckitt, aged sixty-five, of Marrows Wells, Weybridge, Surrey, a director of Reckitt and Sons, Ltd., who was found drowned in a foot of water in a pond at Elloughton, East Yorks, a verdict of "Suicide while of unsound mind" was returned. Medical evidence showed that Mr. Reckitt was very depressed and recovering from a serious attack of influenza. He worried over imaginary troubles but did not exhibit any suicidal tendencies.

THE KING'S BIRTHDAY HONOURS LIST included the following: knighthood, Dr. C. J. Martin, F.R.S., director of the Lister Institute; Order of Merit, Sir Charles A. Parsons, F.R.S., inventor of the steam turbine; K.C.M.G., Mr. A. R. Dickinson, United Kingdom member of the British Phosphate Commission; G.B.E., Sir Frank Heath, late secretary of the Department of Scientific and Industrial Research, and Sir Richard Threlfall, F.R.S.; O.B.E., Mr. V. E. Pullin, B.A., B.Sc., Director of Radiological Research, War Office; C.B.E., Mr. D. J. Davies, B.Sc., F.I.C., Government Analyst, Department of Public Works, Newfoundland.

UNIVERSITY NEWS.—Dr. E. McKenzie Taylor, of St. John's College, and Dr. H. E. Woodman have been appointed respectively lecturer and demonstrator in agricultural chemistry in the University of Cambridge.—At the annual Degree Congregation of Birmingham University, to be held on Saturday, July 2, the Honorary Degree of LL.D. will be conferred upon Professor Arthur Lapworth, F.R.S. (Professor of Chemistry, University of Manchester).—At the Encoenia at Oxford on June 30 it is proposed to confer the honorary degree of Doctor of Science on Sir Robert A. Hadfield, F.R.S., D.Sc.(Leeds), and upon Professor Richard Willstätter, Professor of Chemistry, Munich University.

B. ROOS AND CO., of Berlin, announce that their address has been altered from Voss-Strasse 15, to N.W.7, Schadow Str. 1b, Berlin.

SIR ALFRED MOND has been elected president of the British Science Guild, in succession to Lord Askwith, whose term of office has expired.

THE UNITED INDIGO AND CHEMICAL COMPANY, LTD., have changed their address from Danlee Buildings, Spring Gardens, Manchester, to Union Buildings, Chapel Walks, Manchester.

PLANS ARE PROCEEDING APACE for the erection of by-product coke plant on an area of 3,000,000 sq. ft. of land in western section of Montreal, which was bought recently by the Montreal Coke and Manufacturing Co.

PROFESSOR F. G. DONNAN, C.B.E., F.R.S., of University College, London, has been elected a member of the Royal Academy of Sciences of Amsterdam, thus filling the vacancy caused by the death of Professor Golgi.

A GOLD MEDAL, to be known as the Miller Medal, has been established by the American Welding Society, and will be awarded annually in appreciation of work of outstanding merit in advancing the art and science of welding.

SIR RICHARD TETLEY GLAZEBROOK, K.C.B., F.R.S., has been appointed, by Order of Council dated May 26, 1927, to be a member of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research.

THE CHILEAN NITRATE PRODUCERS' GUILD has decided not to renew its contract with the Suzuki Shoten (who held the agency in Japan) for the importation of Chile nitrate into Japan to compete with German atmospheric nitrogenous fertilisers. The contract expires at the end of June.

RICHARD VIVIAN EVANS, aged 25, an analytical chemist, of St. Stephen's Road, Bayswater, London, who was staying at Newport, Pembrokeshire, went for a swim under Morfa headland on Sunday, June 5. As he did not return the police and fishermen searched for him, but failed to find him.

PROFESSOR E. C. C. BALY, F.R.S., will deliver the second Bedson Club Lecture before the Bedson Club and the Newcastle Sections of the Society of Chemical Industry and the Institute of Chemistry, at Armstrong College, Newcastle, on Friday, June 17, the subject of the lecture being "The Photo-Synthesis of Naturally Occurring Compounds."

IT IS REPORTED FROM CALGARY, Canada, that Mr. Campbell M. Hunter, accompanied by Mr. C. B. Fisher, has arrived to investigate the oil possibilities of Alberta on behalf of British interests, stated to be the Anglo-Persian Oil Co. They have been looking over the Wainwright oil field with a view to acquiring 80,000 acres. Holdings of British Petroleums, Ltd., involving about 30,000 acres, are said to figure in the pending deal.

AT A MEETING OF THE MINERALOGICAL SOCIETY on June 14, the following papers will be read: "On the Atomic Volume Relations in Certain Isomorphous Series," by A. F. Hallemond; "Petrology of the Bodmin Moor Granite (Eastern Part)," by Dr. P. K. Ghosh; "On the Distribution of Purple Zircon in British Sedimentary Rocks," by Professor P. G. H. Boswell; "On the β-quartz Twins from Cornwall," by Dr. J. Drugman; "The Separation of Manganese in Rock Analysis," by E. U. Holt and Dr. H. F. Harwood; "Corundum Twins from Transvaal," by Dr. L. J. Spencer.

RECENT WILLS INCLUDE: Mr. George Tubbs, of the Hockley Chemical Co., Ltd., £33,370 (net personalty £31,880).—Mr. Barratt Carrington Sellars, of Fairfield, Lancashire, and Penrhynside, Llanrhos, manufacturing chemist and Portland cement manufacturer, of the East Lancashire Chemical Co., and the Droylsden Portland Cement Works, £76,372 (net personalty £17,355). By the codicil to his will he cancelled certain legacies "by reason of the losses I have sustained as a result of the recent coal strike."—Mr. Edward Prosser Davis, of 14, Wilton Crescent, Belgrave Square, London, chairman of directors of the Bennerley Iron Co., Ltd., of Ilkeston, £129,022 (net personalty £120,749).

Obituary

MR. EDWIN HALE, a wealthy American retired chemist, who died recently as the result of a bullet wound in the temple, thought to be due to the accidental discharge of a revolver which he was cleaning. Mr. Hale perfected the electrolytic process of extracting zinc from ore.

PROFESSOR WILLIAM CARLETON WILLIAMS, B.Sc., of Broomgrove, Goring-on-Thames, on May 25, aged 76. He was educated at Owens College, Manchester, under the tutelage of Sir Henry Roscoe, where he gained the Dalton Chemical Scholarship, and was enrolled as an associate of the college. After two years study, at Heidelberg and Bonn, he returned to Owens College as a demonstrator in chemistry. In 1893 he succeeded Dr. Carnelly as Professor of Chemistry at Sheffield University, from which position he resigned in 1904. Much of his time was spent in research work on the action of water on lead, and on the distribution of carbon dioxide in the atmosphere. He was a member of the British Association for the Advancement of Science.

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The gelatin precipitation test for tannins. A. E. Jones. *Analyst*, May, pp. 275–276.

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Investigations in the diphenyl series. V. Derivatives of 4-amino- and 4-hydroxydiphenyl. F. Bell and P. H. Robinson. *J. Chem. Soc.*, May, pp. 1127–1133.

Benzidine monohydrate, and notes on recorded melting points of benzidine. R. J. W. Le Fèvre and E. E. Turner. *J.S.C.I.*, June 3, pp. 209–210T.

Higher substitution products of 4-aminodiphenyl. H. A. Scarborough and W. A. Waters. *J. Chem. Soc.*, May, pp. 1133–1140.

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ANALYSIS.—The determination of lactic acid. T. E. Friedemann, M. Cotonio, and P. A. Shaffer. A condenser unit for use in the determination of lactic acid. H. A. Davenport and M. Cotonio. *J. Biol. Chem.*, May, Vol. LXXIII (1), pp. 335–358, 359–362.

GENERAL.—The occlusion of barium chloride by barium sulphate. F. G. Germuth. *Amer. J. Pharm.*, May, pp. 271–274.

Hydrogen sulphide as a laboratory and industrial poison. W. P. Yant. *J. Chem. Ed.*, May, pp. 613–619.

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Use of lime in water softening and water purification. C. P. Hoover. *Ind. Eng. Chem.*, May, pp. 567–570.

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PHYSICAL.—The vapour-pressure curve of benzoic acid. S. Klosky, L. P. L. Woo and R. J. Flanigan. *J. Amer. Chem. Soc.*, May, pp. 1280–1284.

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ANALYSIS.—Determination of the acidity of wines with diazoacetic ester. G. Bredig and K. Siebenmann. *J. prak. Chem.*, May, Vol. 116 (1 and 2), pp. 118–128.

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GENERAL.—The balance sheet of nitrogen in distillation of coal. H. ter Meulen. *Rec. Trav. Chim. Pays-Bas*, May 15, pp. 284–286.

The catalysis of the reaction between persulphates and iodine ions. A. v. Kiss and L. v. Zombory. *Rec. Trav. Chim. Pays-Bas*, May 15, pp. 225–239.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

269,971. Sulphurised Derivatives of Naphthols. Fabriek van Chemische Producten, Schiedam, Holland, and E. Kraus, 125, Juliana van Stolberglaan, The Hague, Holland. Application date, January 26, 1926.

These derivatives are obtained by heating in an aqueous medium a mixture of naphthol, powdered sulphur and an alkali in quantity not greater than the chemical equivalent of the naphthol used. The product is then treated with an aldehyde and a sulphite. The naphthol may be replaced by a mixture of a naphthol and a phenol. The products of the first stages of the reaction are bright yellow powders soluble in alkali to a bright yellow solution and also soluble in acetone alcohol, chloroform, and carbon disulphide. The quantity of alkali should be considerably less than that which is equivalent to the quantity of naphthol, or naphthol and phenol. Examples are given.

270,040. Active Silica, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 26, 1926.

In the usual process for the manufacture of silica gel in which a sol is first produced, the sol contains only a comparatively small amount of free silica, *i.e.*, 1–8·5 grams of silica in 100 cubic centimetres of the liquid. In this process, the solution of soluble silicate or other silicon compounds such as the tetrachloride is added to the decomposing medium so as to produce a sol having a non-alkaline reaction, *i.e.*, neutral or weakly acid to methyl orange or phenol phthalein. The sol contains at least 9 grams of silica in each 100 cubic centimetres of the liquid, and is allowed to set and is washed, dried, and heated. If the acid is added to the silicon compound in the usual manner in producing the sol, part of the silica would separate in flakes, or if the acid is added slowly, the alkaline mixture would suddenly set to a jelly after the addition of only part of the acid. The difficulty is avoided in this invention by effecting the decomposition at low temperatures. The product on drying is a very fine porous gel, very suitable for adsorbing gases and vapours. An active silica with larger pores may be obtained by washing the jelly with slightly alkaline water, with or without an addition of oils or colloids, and this is suitable for refining oils. A volume of 100 cubic centimetres of the silica gel is capable of adsorbing 13–16 grams of benzene from a gas containing 1 per cent. of benzene.

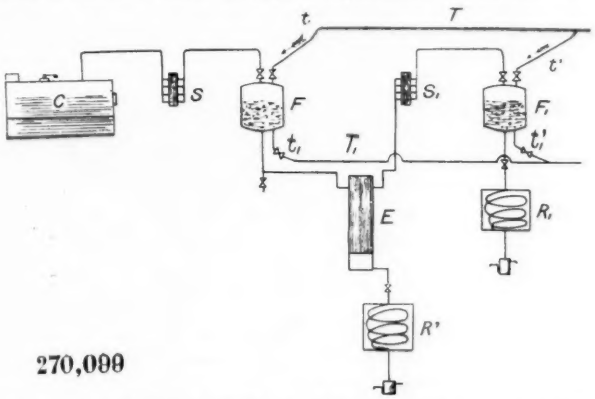
270,091. Unsymmetrical Arylarseno-Compounds, Manufacture of. G. Newbery, Stanmer, Blake's Lane, New Malden, Surrey, and F. J. Paxon, 30, St. George's Road, Palmer's Green, Middlesex, and May and Baker, Ltd., Garden Wharf, Church Road, Battersea, London, S.W.11. Application date, May 7, 1926.

These compounds contain as one-half of the molecule an *N*-arylamino acid amide grouping, particularly an *N*-phenylglycinamide grouping. The compounds are obtained by condensing equimolecular proportions of two differently constituted aryl arsenic compounds, one of which is an *N*-arylamino acid amide and the other an hydroxyamino-arylarsenic compound, or mono-*N*-acyl-derivative thereof, such as a 3-amino-4-hydroxy-phenyl-arsenic compound, or its 3-acetyl-amino derivative. Examples are given of the production of 3-amino-4-hydroxy-4¹-glycinamido-arsenobenzene, 3-acetylamino-4-hydroxy-4¹-glycin-amido-arsenobenzene, 3-amino-4-hydroxy-5 acetylamino-4¹-glycinamido-arseno benzene, and 2-hydroxy-5-acetylamino-4¹-glycinamido-arseno benzene.

270,099. Separation or Recovery of Gases or Vapours by Solid Absorbents, Process for. A. Godel, 3, Rue Nationale, Lagnieu, Ain, France. Application date, May 28, 1926.

In this process the gas or vapour is absorbed by activated carbon or silica gel, and the gases are then recovered and the absorbent regenerated by means of superheated steam. In one form, two absorbing vessels are mounted in series with regard to the steam supply, and in parallel with regard to the gases to be absorbed. The gas is passed through until the absorbent is saturated, and superheated steam is passed into the first vessel to displace the absorbed gas and dry the absorbent. The steam leaving this vessel is saturated or wet, and is then superheated again before passing into the second vessel. In this way, the whole of the latent heat in the steam is utilised and the consumption of steam is diminished. The steam and product then pass to a condenser.

In another form, the gas is passed in through pipes T, t, t^1, to absorbers F, F_1 and then through pipes t_1, t_1^1, T_1. Steam from a boiler C passes through a superheater S, and then to



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the first absorber F, from which it passes to the evaporator E. The condensate and recovered products pass to a cooler R^1, and pure steam from the evaporator E passes to a superheater S_1 and then to the second absorber F_1. The steam and vapour from the latter pass to a cooler R_1. This arrangement avoids the superheating operation between the absorbers, and thus avoids any cracking of the products recovered from the first absorber.

270,428. Azo Dyestuffs and Process of Dyeing Acetyl Cellulose. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, J. Baddiley and J. Hill, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, February 12, 1926.

Secondary disazo dyestuffs are obtained by coupling the diazo compound of a nitro-amine of the benzene or naphthalene series, including derivatives except sulphonic acids and sulphonates, with an unsulphonated amine, then rediazotising and combining with an amine of the benzene series or a derivative except sulphonic acids and sulphonates. Suitable first components include *m*-nitraniline, *p*-nitraniline, 2 : 4-dinitraniline, 4 : 5-dinitro-α-naphthylamine, and picramic acid. The middle components include aniline, *m*-toluidine, cresidine, α-naphthylamine, 1 : 2-aminonaphthol-ether; and the end components include *m*-phenylene-diamine, *m*-toluidine, cresidine, etc. These dyestuffs are insoluble and are applied to acetyl silk directly from a suspension in water, or a dispersing agent such as an acid resin, lignone, or sulphonic acid may be used.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention :—246,526 (U.S. Industrial Alcohol Co.), relating to a process of esterification, see Vol. XIV, p. 335; 247,225 and 259,230 (F. Uhde), relating to synthesis of ammonia, see Vol. XIV, p. 386, and Vol. XV, p. 572; 247,957 (Bakelite Ges.), relating to phenolaldehyde condensation products, see Vol. XIV, p. 444; 250,265 (Commercial Solvents Corporation), relating to synthetic resins, see Vol. XIV, p. 578; 260,305 (Consortium für Elektrochemische Industrie Ges.), relating to acetaldehyde, see Vol. XVI, p. 29; 262,447 (I. G. Farbenin-

dustrie Akt.-Ges.), relating to phosphorus acids and hydrogen, see Vol. XVI, p. 167; 263,844 (I. G. Farbenindustrie Akt.-Ges.), relating to alkylnaphthalenes chlorinated in the nucleus see Vol. XVI, p. 263; 264,791 (Consortium für Elektrochemische Industrie Ges.), relating to acetals, see Vol. XVI, p. 339.

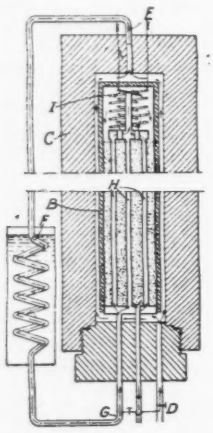
International Specifications not yet Accepted

268,717. INDIARUBBER. Kodak, Ltd., Kodak House, Kingsway, London. (Assignees of S. E. Sheppard and C. L. Beal, Kodak Park, Rochester, N.Y., U.S.A.). International Convention date, April 1, 1926.

Fabric or other material which is to be coated with rubber, is impregnated with a size consisting of an hydrophilous colloid such as glue, starch, or dextrine, acidified by acetic, formic, oxalic, lactic, or other acid to a p_H value of 3–7. For a heavy proofing on thin fabric, a 10–15 per cent. starch solution at 160°–180° F., or a 5–10 per cent. glue solution, or a 0·5–1 per cent. solution of agar-agar may be used, and for a light proofing on one side of a fabric, a viscous size having a p_H value of 4–5 is used. The fabric is passed through a degreasing tank and then under a metal roller which constitutes the anode, and which is immersed in an aqueous emulsion so that the fabric is in the path of the current.

268,721–2. AMMONIA SYNTHESIS. Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude, 48, Rue St. Lazare, Paris. (Assignees of Soc. Chimique de la Grande Paroisse Azote et Produits Chimiques, 13, Rue des Saussaies, Paris.) International Convention date, March 31 and April 1, 1926.

268,721. The outer pressure-resisting wall of the reaction apparatus is maintained at a safe temperature by circulating a gas between the outer and inner walls. The gas may be the reaction mixture before or after treatment. The inner vessel B is coated with a heat insulator which may be thicker at the lower end, and gas is circulated round it from a pipe *D*



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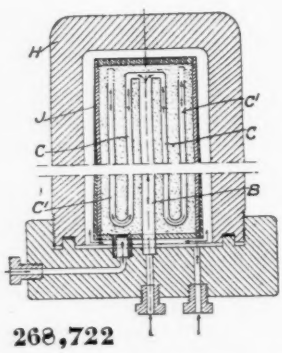


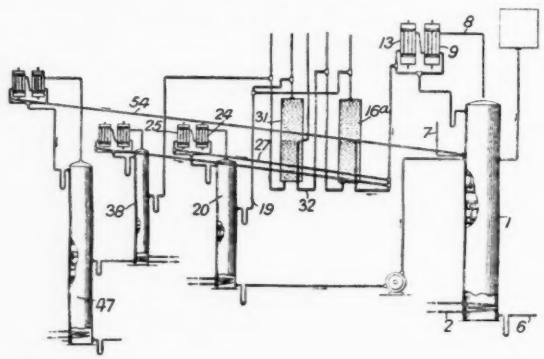
268,722

to a pipe *E*, and thence through a cooler *F*, back to the tubes *H* embedded in the catalyst. The gas may then pass over an electric heater *I* and then through the catalyst to the outlet. Some alternative arrangements are described.

268,722. Heat is transferred from the hotter to the cooler parts of the catalyst by the reaction gases circulating in tubes in the catalyst. The gases may be passed through sinuous tubes *B*, *C*, *C*^{1}, emerging into the hotter part of the catalyst. The tubes *C* may be partly insulated, and may be within the tubes *C*^{1}, which may be coiled. Part of the gases may be circulated round the container *J*.

268,728. DEHYDRATING ALCOHOL. U.S. Industrial Alcohol Co., 110, East 42nd Street, New York. (Assignees of D. B. Keyes, of U.S. Industrial Alcohol Co., Research Laboratory, Baltimore, U.S.A.) International Convention date, March 30, 1926.

Alcohol is distilled in the presence of benzol, ethyl acetate, carbon tetrachloride, hexane, etc., yielding a ternary azeotropic mixture which condenses into two layers. Alcohol and benzol are heated by a steam coil 2 in a dehydrating column 1, the temperature being 79° C. at the base, and 65° C. at the top, and dehydrated alcohol is withdrawn by the pipe 6. The vapours pass by a pipe 8 to a dephlegmator 9 and condenser 13, and some of the condensate returns to the column, while the remainder passes to a settling chamber 16^a. The benzol



268,728

passes by a pipe 19 to a column 20, and pure benzol is drawn off at the base for use again. The vapour passes to a dephlegmator 24 and condenser 25, and the condensate passes by a pipe 27 to the settling chamber 16^a. The lower aqueous layer passes from chamber 16^a to chamber 31 and from thence to a column 38 from the top of which the terniary mixture is obtained and is passed as condensate to 16^a. Aqueous alcohol from the base passes to a rectifying column 27 from which the vapour may pass back to the column 1.

268,735. LIQUID FUEL. Soc. des Brevets Etrangers Lefranc et Cie, 18, Avenue Matignon, Paris. (Assignees of Lefranc et Cie, 2, Rue Blanche, Paris.) International Convention date, April 3, 1926.

The ketones or fractions obtained by dry distillation of the aliphatic salts of calcium, particularly calcium butyrate produced by fermentation, are used as constituents of motor spirit, *e.g.*, in a mixture of equal parts of alcohol and petrol.

268,736. CEMENT AND FERROSILICON. E. C. Eckel, 1503, Decatur Street, Washington, D.C., U.S.A. International Convention date, March 31, 1926.

A mixture of lime, alumina, silica, and iron oxide, with sufficient carbon to reduce most of the iron and part of the silicon, is fused in a blast or electric furnace. Silicious bauxite or high alumina clays can be used as raw materials. The ferro-silicon obtained contains 10–45 per cent. of silicon, and the cement contains lime and alumina in the proportions $5CaO.\ 3Al_2O_3$, with less than 5 per cent. of ferrous oxide, and 15 per cent. of silica.

268,749. OBTAINING BUTYL ALCOHOL AND ACETONE BY FERMENTATION. Commercial Solvents Corporation, Terre Haute, Indiana, U.S.A. (Assignees of W. J. Edmonds, 514½, South Fifth Street, Terre Haute, Indiana, U.S.A.) International Convention date, April 3, 1926.

Fermentation is effected in an atmosphere of the fermentation gases so that the separation of the carbon dioxide and hydrogen is facilitated by the absence of air. The mixed gases may be used for the synthesis of formaldehyde and methyl alcohol.

268,754. DYES. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 31, 1926.

Complex metal compounds of *o*-oxyazo dyes may be treated with reagents which reduce nitro groups to amino or azoxy groups, or which acylate, alkylate, or arylate amino groups; or several molecules of the complex metallic compounds of *o*-oxyazo dyes containing amino groups may be linked together by treatment with phosgene to increase the affinity of the dyes for cotton. Thus, the chromium compound of the dye obtained by coupling diazotised *p*-chlor-*o*-aminophenol with H-acid in alkaline solution is acetylated by treating with acetic anhydride, and several other examples are given.

268,774-5. Catalytic Decomposition of Tars, Oils, and Other Organic Compounds. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention dates, March 30 and April 3, 1926.

268,774. Tars, minerals, oils, etc., are freed from catalyst poisons and then treated with water vapour or gases containing hydrogen in the presence of activated hydrogenating catalysts at a higher temperature than that necessary for the formation of hydrogenated compounds. Atmospheric or reduced pressure, and temperatures of 250°-700° C. are suitable. The catalyst may be iron, nickel, cobalt, copper, zinc, or their oxides or salts, and the activating agent may be oxide of titanium, vanadium, chromium, or manganese, or salts with the hydrogenating catalyst, *e.g.*, copper chromate. The elimination of sulphur may be effected by passing over metal oxides or by treating with hydrogen-containing gases in the presence of activated hydrogenating catalysts obtained from metals whose sulphides are readily reducible. Thus, a mixture of hydrogen and gas oil vapour is de-sulphurised by passing over a heated catalyst obtained by reducing with hydrogen a mixture of copper oxide and chromic anhydride. The oil is then washed with caustic soda and passed with water vapour over nickel activated by alumina and potassium nitrite. A low-boiling oil is obtained.

268,775. Organic compounds are oxidised by heating with an oxygen-containing gas in presence of a catalyst, and decarboxylated in presence or absence of water vapour, using catalysts which split off carbon dioxide. The process may be combined with hydrogenation, de-hydrogenation, or hydration. Thus, acenaphthene may be converted into formaldehyde, with the intermediate formation of naphthalic anhydride, naphthoic acid, naphthalene, phthalic anhydride, benzoic acid, benzene, benzoquinone, maleic anhydride, acrylic acid, and ethylene. Benzene can be obtained by passing heated air and naphthalene vapour over vanadium pentoxide, cooling the products, and passing them over a catalyst of cadmium and aluminium oxides, while, under other conditions, maleic anhydride can be obtained.

268,779. Barium and Calcium Sulphates. T. Lichtenberger and L. Kaiser, 15, Salzgrund, Heilbronn-on-Neckar, Germany. International Convention date, April 3, 1926.

Crude barium or calcium sulphate is dissolved in molten rock salt, insoluble impurities are allowed to settle out, and an acid or basic substance such as lime is then added and air or water vapour is blown through. Any additional impurities are settled out and the molten mass granulated and treated with water to dissolve out the alkali chloride. A pure white sulphate is obtained.

268,789. Diazo Compounds. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 30, 1926.

Aromatic amines are converted into sulphamic acids by treating with a halogen sulphonic acid or an ester thereof, *e.g.*, chlorsulphonic acid, in presence of a tertiary base, *e.g.*, pyridine. The mixture is poured into caustic soda, and the sulphamate isolated after removing the tertiary base, and then diazotised. Sulphamates and diazo compounds from 2:5-dichloraniline, 3:4:5-trichloraniline, 2:3- and 2:5-dichlor-4-toluidine, picramic acid, aminoazobenzene, and aminoazotoluene are described.

269,155. Sulphonic Acids. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, April 7, 1926. Addition to 253,118. (See The Chemical Age, Vol. XV, p. 185.)

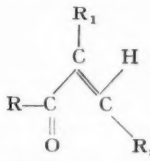
Substituted aromatic sulphonic acids are obtained by treating an aromatic hydrocarbon with methyl or ethyl alcohol and oleum or chlorosulphonic acid.

268,796. Cracking Hydrocarbons. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, April 1, 1926.

Tars, mineral oils, bitumen, asphalt and their distillation products are converted into compounds of lower boiling point by heating with metals which do not cause deposition of carbon when exposed to high temperatures, such as cobalt, chromium, nickel, manganese, tungsten, molybdenum. An autoclave lined with cobalt, and containing cobalt granules may be used, and may be heated internally by a coil of steel rich in chromium and nickel. A number of examples are given of the treatment of low-temperature carbonisation tar, crude mineral oil, brown coal, anthracene oil, etc., to obtain benzene, Diesel engine oils, etc.

268,830. Benzanthrone Derivatives. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, April 3, 1926.

To obtain Bz-substituted benzanthrones, an oxygen-containing reduction product of anthraquinone such as anthrone, anthranol, or oxanthranol is condensed in presence of an acid condensing agent with a compound of the general formula:



where R = alkyl or aryl, R_1 = any monovalent residue such as hydrogen, halogen, hydroxyl, alkoxyl, alkyl, aryl, aralkyl, acyl, aroyl, or carboxylic ester group, and R_2 = hydrogen, hydroxyl, alkoxyl, alkyl, or aryl. The double linkage may be replaced by a single linkage with simultaneous addition of the elements of water or hydrogen halide, *e.g.*, methyleneacetone may be replaced by ketobutanol, and phenylvinylketone by β-chlorpropiophenone. Examples are given of the production of Bz1-methylbenzanthrone, phenylbenzanthrone, Bz1:Bz2-dimethylbenzanthrone, Bz1-ethyl-Bz2-methylbenzanthrone, Bz-diphenylbenzanthrone, two isomeric Bz-methylphenylbenzanthrones, Bz1: Bz3-dimethylbenzanthrone, Bz1-*p*-methoxyphenylbenzanthrone, Bz1-hydroxy-Bz2-acetylbenzanthrone, Bz1-hydroxy-Bz2-benzoylbenzanthrone, Bz1-hydroxy-Bz2-benzanthrone-carboxylic ester, Bz1-hydroxy-Bz2-phenylbenzanthrone.

Specifications Accepted with Date of Application

249,515. Organic arsenic compounds, Process for the manufacture of. F. Lehnhoff-Wyld. March 17, 1925. Addition to 232,612.

249,883. Aralkylamines, Manufacture of—and their derivatives and intermediates. I. G. Farbenindustrie Akt.-Ges. March 30, 1925.

250,955. Aromatic aldehydes, Manufacture of. I. G. Farbenindustrie Akt.-Ges. April 15, 1925.

252,388. Zinc-chloride-bearing solutions, Process for the treatment of. Orkla Grube Aktiebolag. May 22, 1925.

254,742. Vat dyestuffs containing nitrogen, Manufacture of. I. G. Farbenindustrie Akt.-Ges. July 2, 1925.

255,837. Polymerised vinyl-chloride modification and process of utilising the same. L. A. Van Dyk. June 29, 1926.

259,204. Esters, Manufacture and production of. I. G. Farbenindustrie Akt.-Ges. October 5, 1925.

261,048. Complex aurothiosulphate compounds, Production of. F. J. S. Anderson, I. Siesbye, and N. J. H. Weitzmann. November 7, 1925.

264,797. 3-acetylamino-4-oxyphenylarsinic acid, Process for the preparation of a concentrated and stable solution of—by the aid of its ammoniacal salt. Etablissements Poulenc Frères. January 19, 1926.

264,128. Wet-separation of the constituents of mineral and other pulp, Processes and apparatus for. T. G. Martyn. January 7, 1926.

264,804. Ureides of dialkyl- or arylalkyl-acetic acids, Process for the manufacture of. F. Hoffmann La Roche and Co. Akt.-Ges. January 20, 1926.

268,798. Copper-tin-nickel alloy. R. Ozlberger. April 3, 1926.

271,130. Separation of a mixture of liquids having different boiling points. A. Chur. January 22, 1926.

271,146. Intermediate products suitable for the preparation of azo dyestuffs, Manufacture of. British Synthetics, Ltd., and E. B. Higgins. February 17, 1926. Addition to 262,958.

271,169. Glycol ethers, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) February 22, 1926.

271,181. Halogenated indanthrones, Manufacture of. British Dyestuffs Corporation, Ltd., W. D. Rogers, W. V. Stubbins, and F. W. Emerson. March 1, 1926.

271,236. Stabilising hydrocyanic acid, Process for. Deutsche Gold-und Silber-Scheideanstalt vorm. Roessler, and F. Kerschbaum. May 5, 1926.

271,264. Urea and solid polymers of formaldehyde, Process for the manufacture of transparent and colourless condensation products of. F. E. K. Steppes, and H. O. Traun. June 22, 1926.

271,293. Metal alloys, Process of and apparatus for splitting up into their various component kinds of crystals by centrifuging. K. Schmidt. August 10, 1926.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton for home market, 1-cwt. drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—8½d. to 9d. per lb. Crude 60's, 2s. 6d. to 2s. 8d. per gall.

ACID CRESYLIC 99/100.—2s. 8d. to 2s. 9d. per gall. 97/99.—2s. 1½d. to 2s. 3d. per gall. Pale, 95%, 2s. to 2s. 1½d. per gall. Dark, 1s. 9d. to 1s. 10d. per gall.

ANTHRACENE.—A quality, 2½d. to 3d. per unit. 40%, 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.

BENZOLE.—Crude 65's, 1s. 0¾d. to 1s. 1¾d. per gall., ex works in tank wagons. Standard Motor, 1s. 9d. to 2s. 2d. per gall., ex works in tank wagons. Pure, 1s. 7d. to 2s. 6d. per gall., ex works in tank wagons.

TOLUOLE.—90%, 1s. 8d. to 2s. 0½d. per gall. Firm. Pure, 1s. 10d. to 2s. 3½d. per gall.

XYLOL.—1s. 11d. to 2s. 4d. per gall. Pure, 2s. 6d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10½d. per gall. Standard specification, 6¾d. to 9d.; middle oil, 7½d. to 8d. per gall. Heavy, 8½d. to 9d. per gall. Salty, 7d. per gall. less 1½%.

NAPHTHA.—Crude, 8d. to 9d. per gall. according to quality. Solvent 90/160, 1s. 10d. to 1s. 11d. per gall. Solvent 95/160, 1s. 6d. to 1s. 7d. per gall. Solvent 90/190, 1s. 1½d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £7 10s. per ton. Whizzed or hot pressed, £8 10s. to £9 per ton.

NAPHTHALENE.—Crystals, £11 10s. to £13 10s. per ton. Quiet. Flaked, £12 10s. per ton, according to districts.

PITCH.—Medium soft, 70s. to 80s. per ton, according to district; nominal.

PYRIDINE.—90/140, 7s. 6d. to 13s. per gall. Nominal. 90/180, 4s. 6d. to 5s per gall. Heavy, 5s. to 8s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—4s. 9d. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—1s. 6d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—7½d. per lb. naked at works.

ANILINE SALTS.—7½d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—4½d. per lb. Fair inquiry.

m-CRESOL 98/100%.—3s. per lb. Only limited inquiry.

p-CRESOL 32/34° C.—2s. 8¾d. per lb. Only limited inquiry.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb. d/d.

R. SALT.—2s. 2d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—7½d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 10s. to £9 5s. per ton. Grey, £15 10s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£6 15s. to £10 per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall. 16° Tw.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 9d. to 4s. per gall., 60% O.P. Solvent, 3s. 11d. to 4s. 3d. per gall., 40% O.P.

WOOD TAR.—£4 to £5 10s. per ton and upwards, according to grade.

BROWN SUGAR OF LEAD.—£40 15s. to £41 10s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.
ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 6d. per lb.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity. Solely ex Gum, 1s. to 1s. 3d. per oz., according to quantity.
ACID, BORIC B.P.—Crystal, £40 to £43 per ton; powder, £44 to £47 per ton. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 6½d. to 1s. 7½d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P.—1s. 3½d. to 1s. 5d. per lb. Technical.—11¾d. to 1s. per lb.
ACID, TANNIC B.P.—2s. 9d. to 2s. 11d. per lb.
ACID, TARTARIC.—1s. 3¾d. per lb., less 5%. Firm market.
AMIDOL.—9s. per lb., d/d.
ACETANILIDE.—1s. 6d. to 1s. 8d. per lb. for quantities.
AMIDOPYRIN.—8s 6d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: lump, 1s. per lb.; powder, 1s. 3d. per lb.
ATROPINE SULPHATE.—11s. per oz. for English make.
BARBITONE.—6s. 6d. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. to 10s. per lb.
BISMUTH CITRATE.—9s. 6d. to 9s. 9d. per lb.
BISMUTH SALICYLATE.—8s. 9d. to 9s. per lb.
BISMUTH SUBNITRATE.—7s. 9d. to 8s. per lb.
BISMUTH NITRATE.—5s. 9d. to 6s. per lb.
BISMUTH OXIDE.—13s. 9d. to 14s. per lb.
BISMUTH SUBCHLORIDE.—11s. 9d. to 12s. per lb.
BISMUTH SUBGALLATE.—7s. 9d. to 8s. per lb. Extra and reduced prices for smaller and larger quantities respectively; Liquor Bismuthi B.P. in W. Qts. 1s. 1d. per lb.; 12 W. Qts. 1s. per lb; 36 W. Qts. 11½d. per lb.
BORAX B.P.—Crystal, £24 to £27 per ton; powder, £26 to £29 per ton, according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Potassium, 1s. 10d. to 1s. 11d. per lb.; sodium, 2s. 1d. 2s. 2d. per lb.; ammonium, 2s. 3d. to 2s. 4d. per lb., all spot
CALCIUM LACTATE.—1s. 2½d. to 1s. 4½d.
CHLORAL HYDRATE.—3s. 2d. to 3s. 5d. per lb., duty paid.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHER METH.—1s. 1d. to 1s. 11½d. per lb., according to sp. gr. and quantity. Ether purif. (Aether B.P., 1914), 2s. 3d. to 2s. 4d., according to quantity.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—5s. per lb.
HEXAMINE.—2s. 4d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 1 lb., 16s. per doz.; ½ lb., 9s. 6d. per doz.; ¼ lb., 6s. 6d. per doz.
HYDROQUINONE.—4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE B.P.—2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.
IRON PERCHLORIDE.—4d. per lb. to 22s. per cwt., according to quantity.
MAGNESIUM CARBONATE.—Light Commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy Commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 18s. 3d. per lb. net; Synthetic, 10s. 6d. to 12s. per lb., according to quantity; Liquid (95%), 12s. per lb.; Detached Cryst., 14s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10d. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 9d. per lb.
METHYL SULPHONAL.—11s. per lb.
METOL.—11s. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. per lb.
PHENAZONE.—4s. 6d. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—100s. per cwt. less 2½% for ton lots.
POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb. for 1 cwt. lots.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 6d. per lb., spot.
QUININE SULPHATE.—2s. per oz., 1s. 8d. to 1s. 9d. for 1000 oz. lots in 100 oz. tins.
RESORCIN.—4s. per lb., spot.
SACCHARIN.—55s. per lb.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.
SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923—2s. to 2s. 1d. per lb. for 1 cwt. lots. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 95s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 9d. to 1s. 10d. per lb. Crystal, 1s. 10d. to 1s. 11d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
SULPHONAL.—7s. 6d. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 2d. per lb.
THYMOL.—Puriss., 10s. 3d. to 10s. 9d. per lb., according to quantity. Firmer. Natural, 12s. 6d. per lb. Cheaper.

Perfumery Chemicals

ACETOPHENONE.—7s. 3d. per lb.
AUBEPINE (EX ANETHOL), 10s. 6d. per lb.
AMYL ACETATE.—2s. per lb.
AMYL BUTYRATE.—5s. 3d. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—17s. per lb.
COUMARIN.—10s. 6d. per lb.
CITRONELLOL.—14s. 6d. per lb.
CITRAL.—8s. 9d. per lb.
ETHYL CINNAMATE.—10s. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. per lb.
GERANIOL (PALMAROSA).—17s. 6d. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—13s. 6d. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 18s. per lb. Ex Shui Oil, 14s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb.
METHYL BENZOATE.—4s. 6d. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—8s. 6d. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—10s. 6d. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—32s. 6d. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—18s. 6d. per lb. Good demand.

Essential Oils

ALMOND OIL.—10s. 3d. per lb.
ANISE OIL.—3s. 1d. per lb.
BERGAMOT OIL.—30s. per lb.
BOURBON GERANIUM OIL.—14s. 9d. per lb.
CAMPHOR OIL.—67s. 6d. per cwt.
CANANGA OIL, JAVA.—26s. per lb.
CINNAMON OIL LEAF.—6d. per oz.
CASSIA OIL, 80/85%.—8s. 6d. per lb.
CITRONELLA OIL.—Java, 85/90%, 2s. 1d. per lb. Ceylon, pure, 1s. 10d. per lb.
CLOVE OIL.—6s. per lb.
EUCALYPTUS OIL, 70/75%.—2s. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 21s. per lb.
LEMON OIL.—8s. 3d. per lb.
LEMONGRASS OIL.—4s. 6d. per lb.
ORANGE OIL, SWEET.—10s. 6d. per lb.
OTTO OF ROSE OIL.—Anatolian, 30s. per oz. Bulgarian, 70s. per oz.
PALMA ROSA OIL.—9s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 17s. per lb. Japanese, 8s. per lb.
PETITGRAIN OIL.—7s. 9d. per lb.
SANDALWOOD OIL.—Mysore, 26s. 6d. per lb.; 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, June 9, 1927.

OWING to the Whitsuntide holiday business has been rather restricted this week, but there are already signs that the demand is reviving.

General Chemicals

ACETONE is steady at £61 to £63 per ton, according to quantity.

ACID ACETIC is unchanged.

ACID CITRIC is still exceedingly firm at 1s. 6½d. to 1s. 7½d. per lb., less 5 per cent.

ACID FORMIC.—Unchanged at £46 to £48 per ton, according to quantity.

ACID LACTIC.—Unchanged at £43 per ton for 50 per cent. by weight.

ACID OXALIC.—Price unchanged at £27 10s. to £28 10s. per ton.

ACID TARTARIC.—Remains exceedingly firm at 1s. 6½d. per lb.

ALUMINA SULPHATE is in good demand, price unchanged at £6 per ton for 17-18%.

AMMONIUM CHLORIDE is still in good demand at £19 per ton.

ARSENIC.—Unchanged.

CHLORIDE OF BARIUM.—There is a little better demand and quotation remains at £8 10s. to £9 per ton.

COPPER SULPHATE.—Demand is maintained, price firm at about £23 10s.

CREAM OF TARTAR is exceedingly firm, price remains unchanged at £99 to £110 per ton.

EPSOM SALTS.—Unchanged at £5 5s. per ton, with fair demand.

FORMALDEHYDE.—Demand is good, price unchanged at £41 to £42 per ton.

LEAD ACETATE is still on the slow side, price unchanged at £44 per ton for white and £42 per ton for brown.

LEAD NITRATE.—Unchanged at £38 10s. per ton.

METHYL ACETONE is firm at £60 per ton.

METHYL ALCOHOL.—Unchanged.

POTASSIUM CHLORATE is unchanged at 3¼d. per lb.

POTASSIUM PERMANGANATE is still firm at 7½d. to 8d. per lb. for B.P.

POTASSIUM PRUSSIATE.—Firm and in good demand, price £65 to £67 per ton.

SODA ACETATE.—In somewhat poor demand, price unchanged.

SODIUM BICHROMATE.—Unchanged.

SODIUM HYPOSULPHITE.—Unchanged at British makers' figures.

SODIUM NITRITE.—In good demand at £19 10s. to £20 per ton.

SODIUM SULPHIDE.—Unchanged.

SODA PRUSSIATE.—Still in good request at 4½d. per lb.

ZINC SULPHATE.—Unchanged.

Coal Tar Products

The market values of coal tar products show little change from last week.

90's BENZOL is plentiful, and is quoted at 1s. 4d. to 1s. 5d. per gallon on rails, while the motor quality is worth about 1s. 3½d. per gallon.

PURE BENZOL is worth about 1s. 8d. to 1s. 9d. per gallon, on rails.

CREOSOTE OIL is steady at 7d. to 7¼d. per gallon, on rails in the North, while the price in London is 8½d. to 8¾d. per gallon.

CRESYLIC ACID shows no change from last week, the pale quality, 97/99%, being quoted at 2s. per gallon, while the dark quality, 95/97%, is worth about 1s. 10d. per gallon, on rails.

SOLVENT NAPHTHA can be bought at 1s. per gallon, on rails.

HEAVY NAPHTHA is quoted at 11d. per gallon.

NAPHTHALENES are unchanged, the 76/78 quality being quoted at £8 5s. to £8 15s. per ton, while the 74/76 quality is worth about £7 10s. to £8 per ton.

PITCH.—The demand is dull, and supplies are not abundant. Prices remain unchanged at 70s. to 75s. per ton, f.o.b. U.K. ports.

Latest Oil Prices

LONDON, June 8.—LINSEED OIL dull and occasionally 2s. 6d. lower. Spot, ex mill, £34 10s.; June, £33 7s. 6d.; July-August, £33 10s.; September-December, £34. RAPE OIL inactive. Crude extracted, £44; technical refined, £46, naked, ex wharf. COTTON OIL quiet. Refined common edible, £42; Egyptian crude, £36; deodorised, £44. TURPENTINE quiet and unchanged. American, spot, 42s. 9d.; July-December, 44s. 9d.

Nitrogen Products

Export.—Now that the home consuming season has come to an end, not only in the United Kingdom, but in America and Central Europe, larger quantities of sulphate of ammonia are being offered to the importing countries, and, as a consequence, the price has receded to £10 per ton f.o.b. U.K. port in single bags. It seems likely that the stress of this competition will result in still lower prices within the next week or so. June is the month when sulphate is at its lowest, and it will not be surprising if before the month is out, sales of large quantities are actually made on the basis of £9 10s. per ton, f.o.b. U.K. port. Evidence reaches us that very large quantities are being sold in certain markets at these prices. The Mediterranean countries and the Far East are purchasing quantities far in excess of their previous summer requirements.

There is no doubt that the year 1927/8 will show a vast increase in nitrogen production. The large volume of business being transacted at present prices indicates that, if prices are right, there is little likelihood of consuming markets being unable to absorb this increased production.

Home.—British producers have announced that the home prices, until further notice, will be the same as for the season just passed. The continuation of last year's price scale is merely a stopgap to enable producers to take a more accurate survey of the situation before committing themselves definitely to a new scale. Moreover, in one or two consuming districts, the demand continues right through June. As the home demand has not, therefore, fallen off entirely, there seems little necessity for a early drop in the price. There is considerable difference of opinion about the scale which will be fixed for 1927/28. We are inclined to the view that the new scale will be from 10s. to £1 per ton below the 1926/27 scale.

Nitrate of Soda.—The producing companies in Chile continue to sell for near delivery positions at 16s. 4d. to 16s. 9d. per metric quintal. It had been estimated that 450,000 tons has been sold for 1927/28 at these prices. The present production of nitrate has been estimated at 100,000 tons per month, but further oficinas expect to reopen shortly, and the annual production for 1927/28 has been estimated at 1,800,000 tons. As the nitrate producers will be handicapped by the large stock in Chile, it seems unlikely that this production and some of the stock will be disposed of within the coming year without some reduction of present prices. During 1926/27, the high prices at which nitrate was selling, allowed the inroad of newer forms of nitrogen into certain markets. It remains to be seen whether this movement will receive a set-back now that nitrate is selling at lower prices.

Sulphate of Ammonia

NITRAM, LTD., Victoria Station House, London, S.W.1, announce that they have decided to continue selling sulphate of ammonia for home agricultural use until further notice at the current prices of £12 6s. per ton for neutral quality, and £11 16s. per ton for ordinary quality, delivered carriage paid in 4-ton lots and upwards to buyer's nearest station, or ex works in 1-ton lots and upwards.

A Lautaro Nitrate Rumour

A REPORT has been given currency that the Lautaro Nitrate Company is returning concessions in the nitrate fields, together with a cash indemnity, to the Chilean Government. The company announced on Saturday the receipt of a telegram from the local board in Chile setting out the real facts as follow:—"We were in possession of titles for 20 estacas, bought for £25,000, which we tried to locate, but, as the Chilean authorities do not wish new mensurations to be made, we have preferred, in accordance with the sellers, to renounce our right of prosecution and legal procedure. In exchange, we have obtained from the original owners of the titles other nitrate rights of equivalent value and £6,000. A small portion of the grounds destined for these 20 estacas was exploited, this being an accepted practice in the case of grounds under transfer, and, in renouncing the same, we have agreed to pay the Government £10,000 for nitrate already extracted. The local board considers this a very satisfactory arrangement, which is terminating in Santiago to-day."

THE AMALGAMATION of the Snia Viscosa and Varedo artificial silk concerns of Italy, which has been rumoured for some time, is now confirmed. The Snia has acquired a majority of the share capital of Varedo, so that it is to all intents and purposes a fusion. As a consequence Varedo becomes indirectly linked up with Courtaulds and Glanzstoff. The Varedo group, whose total capital is L.140,000,000, has mills at Varedo, Magneta, Ceriano and Aquila. After a brilliant start, which led to the payment of a dividend of 30 per cent. for 1925, the concern fell upon evil times, and for 1926 no dividend was paid. The installation of the machinery in the new Magenta mill was suspended. The present agreement affords yet another demonstration of the fact that under the conditions which the artificial silk industry has created for itself even a well-established concern, producing on a large scale, cannot stand alone.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, June 8, 1927.

BUSINESS in the heavy chemical market has been moderately active during the past week, but most inquiry has been for home consumption. Prices remain unchanged.

Industrial Chemicals

ACID ACETIC.—98/100%, £55 to £67 per ton according to quantity and packing, c.i.f. U.K. ports; 80%, pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton; powder, £36 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In moderate demand and now quoted 8½d. per lb., f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Unchanged at about 1s. 6½d. per lb., less 5%, ex store, for either continental or British material.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. 9d. per carboy. Dearsenicated quality, 6s. 3d. per carboy, ex works.

ACID NITRIC 80°.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC.—Still in good demand and price unchanged at 3d. per lb., ex store, spot delivery. Offered from the Continent at 2⅞d. per lb., ex wharf.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 3½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18% IRON FREE.—Spot material quoted £5 12s. 6d. per ton, ex store. On offer for early delivery at £5 5s. per ton, c.i.f. U.K. ports.

ALUM POTASH.—Lump quality quoted £8 per ton, c.i.f. U.K. ports. Crystal powder, 5s. per ton less. Lump on spot, £9 per ton. Crystal powder, £8 10s. per ton, ex store.

AMMONIA ANHYDROUS.—Now on offer at 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of English manufacture quoted £23 to £24 per ton, ex station. Continental material on offer at about £19 15s. per ton, c.i.f. U.K. ports. Fine white crystals quoted £18 per ton, c.i.f. U.K. ports.

ARSENIC.—White powdered quoted £18 per ton, ex wharf, prompt despatch from mines. Spot material available at about £19 per ton, ex store.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals on offer from the Continent at £7 12s. 6d. per ton, c.i.f. U.K. ports, packed in casks. Bags, 5s. per ton less. Spot material quoted £9 5s. per ton, ex store.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers, £8 per ton, ex station, minimum 4 ton lots. Spot material, 10s. per ton extra. Continental now quoted £7 10s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 to £5 5s. per ton, ex station, with a slight concession for contracts. Continental quoted £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—Continental material quoted £24 15s. per ton, ex wharf. British material on offer at about the same price, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Unchanged at £38 per ton, c.i.f. U.K. ports. Spot material quoted £39 5s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental now £2 17s. 6d. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material quoted £33 per ton, ex store.

LEAD, WHITE.—About £33 5s. per ton, ex store.

LEAD ACETATE.—White crystals offered from the Continent at £42 7s. 6d. per ton, c.i.f. U.K. ports; brown about £40 5s. per ton, c.i.f. U.K. ports; white crystals offered on spot at about £43 15s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

MAGNESIUM CHLORIDE.—Quoted £6 6s. 6d. per ton, c.i.f. U.K. ports.

POTASH CAUSTIC, 88/92%.—Solid quality quoted £28 15s. per ton, c.i.f. U.K. ports, minimum 15 ton lots. Under 15 ton lots, £29 10s. per ton. Liquid, £15 per ton, minimum 15 ton lots. Under 15 ton lots, £15 7s. 6d. per ton, c.i.f. U.K. ports.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Quoted £27 5s. per ton, ex wharf, early shipment. Spot material on offer at about £28 10s. per ton, ex store.

POTASSIUM CHLORATE.—Powdered quality on offer at £24 5s. per ton, c.i.f. U.K. ports. Crystals, £2 per ton extra.

POTASSIUM NITRATE.—Rather cheaper offers from the Continent. Now quoted £20 12s. 6d. per ton, c.i.f. U.K. ports. Spot material available at £21 per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6½d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE, YELLOW.—In good demand and price unchanged at about 7½d. per lb., ex store, spot delivery. Offered from the Continent at 7¼d. per lb., c.i.f. U.K. ports.

SODA CAUSTIC.—Powder, 98/99%, £19 7s. 6d. per ton; 76/77%, £15 10s. per ton; 70/72%, £14 10s. per ton, carriage paid station, minimum 4 ton lots on contract. Spot material, 10s. per ton extra.

SODIUM ACETATE.—English material quoted £22 per ton, ex store. Continental now on offer at £17 15s. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¼d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powder or pea quality, £1 7s. 6d. per ton more; alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 10s. per ton, ex store, minimum 4 ton lots. Continental on offer at about £8 2s. 6d. per ton, ex wharf, prompt shipment. Pea crystals of British manufacture quoted £15 5s. per ton, ex station, 4 ton lots.

SODIUM NITRATE.—Ordinary quality quoted £13 per ton, ex store; refined quality, 5s. per ton extra.

SODIUM NITRITE, 100%.—Spot material quoted £20 15s. per ton, ex store.

SODIUM PRUSSIATE, YELLOW.—Offered for prompt shipment from the Continent at 4⅜d. per lb., ex wharf. Spot material on offer at 4½d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption, £3 7s. 6d. per ton, ex works.

SODIUM SULPHIDE, 60/65%.—Solid, £11 10s. per ton; broken, £12 10s. per ton; cakes, £12 10s. per ton; flake, £14 5s. per ton; crystals, 31/34%, £7 15s. to £8 10s. per ton, according to quality, delivered buyer's works, minimum 4 ton lots on contract. Prices for spot delivery are 5s. and 2s. 6d. per ton extra for solid and crystals respectively. Offered from the Continent at about £9 7s. 6d. per ton c.i.f., U.K. ports; broken, 15s. per ton extra.

SULPHUR.—Flowers, £12 10s. per ton; roll, £11 10s. per ton; rock, £11 10s. per ton; floristella, £10 10s. per ton; ground American, £9 5s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid, on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material on offer at about £10 10s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Merchandise Marks: Uncompounded Drugs

THE British Chemical and Dyestuffs Traders' Association states that with regard to the order of the Board of Trade for the exemption of uncompounded drugs and medicines from liability to the provisions of the Merchandise Marks Act, it should be understood that the phrase does not include chemicals. At the moment it is believed that only crude drugs is meant and the Board of Trade has been asked to supply a definite interpretation of the phrase.

Company News

SHAWINIGAN WATER AND POWER CO.—A dividend of $0.50 per share has been declared on the common shares for the quarter ended June 30, payable on July 11.

FULLERS' EARTH UNION.—The profit for the year to March 31, 1927, was £15,094, against £20,211 last year, making available, with £1,967 brought forward, £17,061. A final dividend of 7½ per cent., making 10 per cent. for the year, is proposed, placing £5,000 to reserve and carrying forward £1,843.

UNITED INDIGO AND CHEMICAL CO., LTD.—At a meeting of the directors held on May 24, it was decided that a dividend at the rate of five per cent. (5%) per annum, subject to income tax at 4s. in the £, for the six months ending June 30, be paid in respect of the preference shares, and that the preference transfer books be closed from June 23 to 30 inclusive.

YORKSHIRE DYEWARE AND CHEMICAL CO.—For the year ended March 31 last, the report states that after providing for depreciation of property, plant and machinery, etc., the surplus amounts to £11,737, to which is added the balance brought forward of £5,595, making £17,332. The interest on debenture stock requires £4,104, and the directors recommend a dividend at the rate of 7½ per cent. (making, with the interim dividend, 10 per cent. for the year), less tax at 4s. in £, carrying forward £1,228.

SCOTTISH OILS, LTD.—The balance at the credit of profit and loss account for the year ended March 31 last, including £44,937 brought in, and after providing for depreciation, is £217,675. After meeting the year's dividend on 7 per cent. preference shares, there remains £51,730, which the directors propose to carry forward. During the year operations were carried on under considerable difficulty, owing to general strike and prolonged coal stoppage, but no interruption to company's refining operations took place.

AMALGAMATED PHOTOGRAPHIC MANUFACTURERS.—The net trading profit for the 12 months ended December 31, 1926, amounts to £37,100, from which must be deducted interest payable, £7,333, and reserve for depreciation, £8,424, leaving £21,343, to which must be added balance brought forward from 1925 of £20,976, making £42,320. The directors recommend the payment of half-year's dividend at rate of 8 per cent. per annum, less income tax, on "A" preference shares to December 31, 1926, since paid, carrying forward £34,483. Directors regret that they are not able to recommend payment of a dividend on "B" preference and ordinary, owing to necessity of conserving financial resources.

LIQUID AIR, LTD.—The report covering the fifteen months ended March 31, 1927, states that after deducting outstanding legal expenses in connection with the year 1925, all of which are now finally disposed of, also certain award expenses of a non-recurring nature, and including the balance brought forward for that year, and after providing for income tax, depreciation, and bad debts for the period under review, the balance available for distribution is £3,668, which the directors consider should be carried forward. A general meeting will be held at the works of the company, Wembley, on June 24, at 12.15 p.m., when the shareholders will have an opportunity of seeing the change in conditions under which the company will be operating at an early date.

BRITISH CELANESE, LTD.—The profit and loss account for the year to February 28 last shows a final net profit, subject to depreciation, of £223,193. The directors propose to place the whole of the net profit to the credit of the depreciation reserve account, which will then stand at the sum of £536,932. During the year the options on the 1,160,000 unissued ordinary shares expired. The company became entitled to a participation in the profits resulting from the formation by the Swiss group of Canadian Celanese. The participation is at least 20,000 shares of common stock. As in the case of the holding of American Cellulose (now Celanese of America), no value is for the present placed upon this holding in the balance sheet. The loan of £50,000 from the Government was reduced by £10,000 during the year, and the balance of £40,000 has since been repaid. Continuous progress has been made in the direction of reduced costs of production and of economy generally. At the end of the year the company had a greater production and a larger turnover than ever before, supported by very substantial cash resources available for all foreseen requirements or for further expansion.

ZINC CORPORATION, LTD.—In their report for the year ended December 31, 1926, the directors state that the profits for the year were affected by the suspension of productive operations necessitated by the shortage of water, and, to a larger extent, by reason of the lower metal prices. A further improvement in metallurgical practice has provided some compensation for these two adverse factors. The profit for the year was £424,048, to which is added the balance of appropriations for mine development and new plant at December 31, 1925, now written back, of £73,162, making a total of £497,210. There has been appropriated for mine development and new plant £100,000, to cost of acquisition of additional shares in Broken Hill Associated Smelters Propy., Ltd., £5,000, and carried to reserve £20,000. Including the balance brought forward from 1925 of £13,373, there is now available for distribution a total of £201,621. The directors recommend a final participating dividend of 4s. per share (making total distributions for the year of 7s. per share on the ordinary shares and 11s. per share on the preference shares), carrying forward £21,855. The annual meeting will be held at River Plate House, London, E.C., on June 15, at 12 noon.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Gee & Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to June 25, 1927.

"OSALON."

447,218. Class 4. A vegetable starch, for use in finishing textile fabrics. Naamlooze Venootschap Frankendonders (a joint stock company organised under the laws of Holland), United Alinine Works, Spoorlaan 28, Tilburg, Holland; dyers and chemical manufacturers. January 28, 1927.

"KODACOLOR."

479,249. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Kodak, Ltd., Kodak House, Kingsway, London, W.C.2; manufacturers and dealers. March 29, 1927. (To be Associated. Sect. 24.)

"TRUZONE."

479,935. Class 1. A chemical substance used in manufacture. B. Laporte, Ltd., The Chemical Works, Kingsway, Luton, Bedfordshire; chemical manufacturers. April 8, 1927.

"SYNTHOS."

478,556. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Murphy and Son, Ltd., The Cedars, Sheen Lane, Mortlake, London, S.W.14; technical chemists. March 8, 1927. (To be Associated. Sect. 24.)

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LINSEED OIL, COCO-NUT OIL, ETC.—A firm of agents in Oslo desires to obtain the representation of British exporters. (Reference No. 601.)

PHARMACEUTICAL PRODUCTS, ETC.—A Swiss firm at Geneva desires to secure the representation of British manufacturers. (Reference No. 603.)

PAINTS, ETC.—A well-established agent in Panama City wishes to represent, on a commission basis, British manufacturers. (Reference No. 606.)

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INSTALLATIONS can be supplied for Pulverising

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It has been designed and built to fulfil the recognised and essential requirements of a unit machine which shall be suitable for the general purposes of Industrial application. It is both fool-proof and fire-proof and requires no skilled attention to operate. In addition, it costs from 30% to 50% less than any other type on the market, and as upkeep and wear and tear are reduced to a minimum, the total cost of Pulverising per ton is a very small item.

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Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

BENTHAM CHEMICAL CO., LTD. (YORKS). (M., 11/6/27.) Registered May 18, £500 debentures; general charge.

BICKERSTAFFE, WHELAN AND CO., LTD., Elland, soap manufacturers. (M., 11/6/27.). Registered May 25, £1,600 debenture to H. Rothwell, Heymoor House, Shepley, heald and reed maker; general charge.

BRITON FERRY CHEMICAL AND MANURE CO., LTD. (M., 11/6/27.) Registered May 27, debenture to bank, charged on properties at Llanelly and Briton Ferry, also general charge. *£107,405. March 29, 1927.

SITORA, LTD., London, N., chemical manufacturers. (M., 11/6/27.) Registered May 26, £200 debenture to Sterns, Ltd., 16, Finsbury Square, E.C.; general charge. *——. March 25, 1927.

Satisfactions

ROWE (T. B.) AND CO., LTD., Brentford, soap boilers. (M.S., 11/6/27.) Satisfactions registered May 30, £1,500, balance of amount registered February 20, 1906, and £1,000, balance of amount registered February 8, 1913.

SOUTH AFRICAN CARBIDE AND BY-PRODUCTS CO., LTD., London, E.C. (M.S., 11/6/27.) Satisfaction registered May 17, £55,125, total outstanding of amount registered January 10, 1922

SOUTH BANK CHEMICAL CO., LTD. (M.S., 11/6/27.) Satisfaction registered May 18, £6,000, registered April 3 and November 13, 1913.

WOOD, MORRIS AND CO., LTD., Leeds, dyers of cloth, etc. (M.S., 11/6/27.) Satisfaction registered May 23, £5,000, registered December 5, 1917.

London Gazette, &c.

Company Winding Up

FOX AND CO. (CHEMICALS), LTD. Last day for receiving proofs for intended dividend, June 22. Liquidator, J. G. Gibson, Senior Official Receiver and Liquidator, Byrom Street, Manchester.

Company Winding Up Voluntarily

CLEENEEZE, LTD. (C.W.U.V., 11/6/27.) H. Bawden, 7, Union Court, Old Broad Street, E.C., appointed liquidator, March 24.

Notice of Dividend

HADDOCK, John, 77, Whitehall Road, West Bromwich, manufacturing chemist. First and final dividend, 1s. 10½d. per £, payable June 13, Official Receiver's Office, 191, Corporation Street, Birmingham.

Notice of Intended Dividend

PICKLES, Robert Henry, Prussiate Works (also known as Manganese Works), Droylsden, Manchester, trading as R. H. PICKLES AND CO., chemical manufacturer. Last day for receiving proofs, June 21. Trustee, A. Yearsley, 27, Brazennose Street, Manchester.

New Company Registered

GELATINE MANUFACTURING COMPANY, LTD., Atlantic House, 46, Holborn Viaduct, E.C.1. Registered June 3. Nom. capital, £1,000 in £1 shares. Manufacturers of and dealers in gelatine and gelatinous substances and preparations of all kinds, essential oils, essences, flavours and perfumes and all oleaginous and saponaceous chemical and industrial substances, etc. Director: R. de Kat.

H. S. MOSS AND CO., LTD. Registered June 2. Nom. capital, £20,000 in £1 shares (15,000 10 per cent. cumulative preference and 5,000 ordinary). To acquire the business of a varnish and paint manufacturer now carried on by H. S. Moss at Moor Road Works, Moor Road, Chorley, as "H. S. Moss and Co." The permanent directors are:—H. S. Moss (chairman), 45, Ashfield Road, Chorley; and Mrs. E. L. Moss.

Large Water Softening Plant for Railway

Of some interest, as representing the latest practice with lime and soda ash, is a large plant now being supplied to the Annesley Depot (Nottingham) of the London and North-Eastern Railway Company. It is being installed by the Paterson Engineering Co., Ltd., of London, and is of the vertical cylindrical type, being capable of dealing with a maximum of 100,000 lb. of water per hour. The main tank is no less than 37 ft. high and 18 ft. in diameter, is constructed of riveted steel plates, and has a period of five and a half hours for reaction and settlement. The water to be treated is of very difficult quality, having 38·51 degrees of total hardness, of which 18·25 is temporary, while a very high proportion of objectionable magnesium salts are also present, which in most types of softening plants give rise to trouble as regards complete separation. It is for this reason that a longer period of settling has been allowed, with the provision in the main centre drop tube of an agitator driven by a chain from the water wheel shaft. The main feature of this type of plant is the patent "Osilameter" by-pass feed gear for the continuous and automatic addition of the lime and soda-ash solution, always in proportion to the flow in accordance with the demand for soft water.

I.C.I. Exhibit at Quarrying Plant Exhibition

An exhibition of quarrying plant, machinery, etc., will be shown at Harrogate from June 28 to July 1. On stand No. 50 in Row "A" will be seen a very interesting and comprehensive exhibit of explosives and accessories as applied to quarry blasting, arranged by Nobel Industries, Ltd., of Imperial Chemical Industries, Ltd., Nobel House, Buckingham Gate, London, S.W.1. The exhibits will include dummy specimens of all the most modern types of explosives used in quarry blasting, detonators, both ordinary and electric, fuses for wet and dry ground, detonator nippers, cordeau detonant, cordeau slitters and cutters, waterproofing compound, various exploders, shotfiring cables, galvanometers, etc. A special feature of interest will be a scale model of a limestone quarry showing in detail the most up-to-date methods of blasting—*i.e.*, well drill, tunnel blasting, etc., etc. The model has been so constructed as to show in section the positioning of holes for various types of blasting, and details are given as to weight of charge to be used for particular strata to be dealt with. There will also be displayed a historical showcase showing the manufacture of explosives from the earliest days to present day types.

Benn Brothers' Other Journals

The Cabinet Maker.—Modern Textiles; Retail Furnishing Advertising; Inside of a Mattress—XXXI; Sponge-Rubber Mattresses; Modern Metal Bedsteads—IV: Models for the Nursery; Birmingham School of Arts and Crafts: Exhibition of Students' Work.

The Electrician.—New Generating Station at Stourport; "Silica Valves in Wireless Telegraphy," by H. Morris-Airey, G. Shearing and H. G. Hughes; "The Holweck Demountable Type Valve," by C. F. Elwell; Deptford Revisited.

The Fruit Grower.—Thinning Apples: Effect on Colour and Size, by W. Stephen Rogers; Fifth Tour of Plantations (illustrated); New Knights.

Gardening Illustrated.—The Iris Show (freely illustrated); Notes from a West Somerset Garden; Cultivation of St. Brigid Anemones; Japanese Maples; Cleaning Vegetable Crops.

The Gas World.—Preliminary Institution Number; Arrangements for Visit of Institution of Gas Engineers to Nottingham; "Elementary Thoughts on Gas Distribution," by Mr. Walter Hole.

The Hardware Trade Journal.—Hire Purchase: Pros and Cons of Easy Payment Systems; Wickless Stoves and Blow Lamps; Metal Prices Chart; Features of New Selling Lines.

The Timber Trades Journal.—Belgian Import Customs, by General von Enckell; Diminishing Finnish Stocks; Russian Views on the Break; The Ideal Saw Doctor.

The Nursery World.—Home Nursing: The Importance of the Bed; The Difficult Child: Sleeplessness; A Garden Apron and Table Cloth; First Lessons: Handwork; Where Shall we go for the Holidays?